AMERICAN
STATISTICAL ASSOCIATION.

NEW SERIES, Nos. 67–68. SEPT.–DEC., 1904.

THE BREAD AND MEAT OF THE WORLD.*

By Yves Guyot.

I. The Necessary Ration. II. Ration of the French Soldier. III. Ration Necessary for the French People. IV. Bread in France. V. Grain of the World. VI. Meat in France. VII. Increase of the Urban Population and Increase of Animal Food. VIII. Price of Food in the Cities of New England. IX. Consumption of Meat in the United Kingdom. X. Animal Food of the World. XI. Population and Food. XII. Economic Oligarchy in France. XIII. Conclusions.

I. The Necessary Ration.

In the United States the experiment stations of the Department of Agriculture, about ten years ago, began, under the direction of Mr. A. C. True, an investigation into the nutritive value of different foods and their comparative prices. These investigations were conducted by Mr. W. O. Atwater, assisted by collaborators of the first rank.† Following his study entitled the "Principles of Nutrition and Nutritive Value of Food," I wish to state the conditions of human nourishment. The human body is composed of

*Translated from *Revue du Commerce, de l'Industrie et de la Banque*, Oct. 1, 1904.

†Published by the Department of Agriculture.

from 15 to 20 elements, first among which are water and the mineral elements, such as phosphate of lime, which is the foundation of bone.

Then come, forming 18 per cent. of the average weight of the body of an average man, the protein substances, divided into two groups: (1) those albuminoids contained in substances like white of egg, lean meat, casein of milk, gluten of wheat; (2) the gelatinous substances, which form chiefly the connecting tissues, such as the tendons, the skin, and the periosteum of the bone. These elements constitute the human body. They serve also as fuel, for they are burned to produce energy, and are again transformed into fat.

Sugar and starch may equally be stored up as fat in the body. Fat makes up 15 per cent. of the weight of an average man.

The hydrates of carbon include starch, sugar, cellulose, and are found particularly in milk, cereals, and potatoes; but the hydrates of carbon form only 1 per cent. of the tissues of the human body. Sugar and starch furnish a vast amount of energy, and are easily transformed into fat.

There is some waste in foodstuffs, such as meat bones, fish bones, egg shells, and the skins of fruits, which are not edible.

The function of food is: first, to furnish the materials of the body and to repair its waste; second, to maintain the heat of the body and produce the power used in action. By means of a calorimeter the amount of energy calculated in calories, expended by man, can be measured. A calorie is understood to be the amount of heat necessary to raise the temperature of a kilogram of water one degree centigrade, which, translated into terms of mechanics, equals 423.5 kilogram-metres. An adult produces in twenty-four hours about 2,400 calories, about a hundred an hour. He loses, moreover, from 1,300 to 1,350 cubic centimetres of water through the kidneys, 700 cubic centimetres through the skin, and 450 through the lungs. He exhales a quantity of car-

bonic acid, containing 610 to 690 grams of oxygen and 230 to 260 grams of carbon. He throws off nearly 240 to 270 grams of this vast element through various excretions. He loses through the bowels and kidneys 22 to 23 grams of mineral salts, of which more than half is sea salt.* The ration for subsistence requires, therefore, foods furnishing an equivalent to what is expended, but for work a larger ration is necessary. Atwater gives the following estimates of necessary rations:—

For a Person having	Protein Substances.		
	Total Grams.	Digestible Grams.	Calories.
No physical exercise	90	83	2,450
Moderate exercise	112	103	3,050
Moderately active exercise	125	115	3,400
Hard physical labor	150	138	4,150
Very hard physical labor	175	161	5,500

These figures are certainly not exaggerated. According to some experiments made in Scotland on prisoners employed in breaking rock, and working eight hours a day, Dr. Dunlop finds that 3,700 calories are necessary for an adult doing only moderately active work.

II. The Ration of the French Soldier.

In times of peace the actual ration of the French soldier is 750 grams of bread, 300 grams of meat, not counting vegetables, sugar, and coffee. Besides the regulation bread distributed by the State, there is the bread bought with soup at the baker's, at a rate of 125 grams per portion of soup.

The two portions of soup a day under the old régime, now discarded, were equivalent to 250 grams; and the allowance of bread was increased to 1 kilogram.

By ration is here meant the ration of untrimmed meat.

*"L'Alimentation," by Armand Gautier.

The usable meat given out to the troops contains hardly more than 35 per cent. of assimilable matter,—about 100 grams out of 300.

The regular campaign ration is 750 grams of bread, 400 grams of fresh meat or 240 grams of salt pork or 200 grams canned meat, 60 grams dried vegetables or rice, 30 grams lard or 25 grams condensed soup, 20 grams salt, 21 grams sugar, 16 grams roasted coffee, 0.25 litre wine.

The ration for a hard campaign consists of 500 grams fresh meat or 300 grams salt pork or 250 grams canned meat, 30 grams sugar, 24 grams roasted coffee. We should compare the ration of the French soldier in time of peace with that of a man doing moderate physical labor:—

	Protein Grams.	Calories.	Rate of Nutrition of the Ration.
Eaten	125		
Digestible	103	3,400	6.2

Ration of a French soldier:—

Meat with an average of 15 per cent. of protein matter $\times$ 300 grams = 45 grams.

Bread or a substitute: 10 hectos. $\times$ 9.2 = 92 grams,—a total of about 137 grams of absorbed protein substances.

Our figures are a little above those given by Atwater for a man engaged in moderate physical labor; but he attributes only 16 to 20 per cent. of waste to meat, and we have found that one should reckon it to be 35 per cent. for the meat furnished the troops.

In calories:—

300 grams of meat	=	666
1,000 grams of white bread	=	2,660
		3,326
Quarter of the ration of sugar, $\frac{10 \text{ grams}}{4}$	=	2.5 grams

gives for 1,750 calories per English pound, 9 calories.

Some vegetables must be added; but one can hardly reach the number of 3,400 calories, which should be regarded as rather below than above the necessary amount.

III. Ration Necessary for the French People.

In the "Essai d'arithmétique politique sur les premiers besoins de l'intérieur de la République," published in 1796, the celebrated mathematician, Lagrange, designated animal food as "butcher's meat," pork included; while the ordinary cereals, including wheat, rye, and barley, he grouped as grain.

As the basis for his estimates, he took the military ration, which for each soldier was 28 ounces of bread ($1\frac{3}{4}$ pounds) and half a pound of meat.

But how does he estimate for the whole population? "In a family composed of husband, wife, and three children under ten years of age, the father alone consumes nearly as much as the rest of the family."

Estimating one-fifth of the population to be under ten years of age, he holds that the consumption of this fifth counterbalances the smaller consumption of the women as compared with that of the men; and, having still to account for the diminished consumption of old people, he concludes that the total consumption of all the inhabitants of France should represent only four-fifths of the consumption of an equal number of soldiers. Lagrange thus arrives at the figures of 20 millions out of 25 millions of inhabitants.

Following the example of Lagrange, I take as typical the ration of the soldier in time of peace. In order to ascertain the reduced consumption among children under 15, women from 15 to 59, inclusive, and old people above 60 years of age, I have divided the population of the different ages into large groups, according to the censuses of 1876 to 1896, and increased the number of individuals of reduced consumption. Thus out of 1,000 persons I estimate 20

per 1,000, although the number of children is only 16 per 1,000 under 1 year.

For 1,000 persons of both sexes we have:—

Under 1 year	20
From 1 to 14 years, inclusive	260
From 15 to 59 years	600
60 years and over	120
	1,000

Some physiologists estimate that the nutriment required by a woman equals three-fourths of that required by a man; that the nutriment needed by an old person can be compared to that for a woman. I have left wholly out of consideration the nutriment of children under the age of one year.

Under these conditions the figures for rations of food per 1,000 inhabitants will be:—

For men	300
For women and old persons	315
For children	195
Total	810

In round numbers the figures for the rations of adults represent four-fifths of the total population. Population enumerations and recent observations on the proportions of nutrition give exactly the same figures as those obtained by Lagrange.

Atwater has established by experiments the following proportions:—

Man doing moderate physical work	1
Man doing hard physical work	1.2
Man doing light physical work and children from 15 to 16 years	0.9
Man doing sedentary work; woman doing moderate physical work; boy of 12 years; girl of 13–14 years	0.8
Woman doing light work; boy of 12 years; girl from 13–14 years	0.7
Boy of 10–11 years; girl of 10–12 years	0.6
Child of 6–9 years	0.5
Child of 2–5 years	0.4
Child under 2 years	0.3

These figures approach the proportions determined by Lagrange and myself. But I reduce the proportion of a fifth to a quarter; and, if, to simplify the computation, I carry the population of France to the number of 40 millions instead of 30, I have a total of 39 millions instead of 31,200,000.

Through the tax of 7 fr. on grains, of 20 fr. on the metrical hundred weight of live cattle, of 25 fr. on the hundred weight of live mutton, which brings the tax on the net weight of butcher's meat to 35 fr., the land-owners have secured the monopoly of furnishing bread and meat for the French population.

In what measure can they provide for it?

IV. Bread.

The question is often asked, How many kilos of bread are produced from 100 kilos of flour? The reply is simple. 100 kilos of flour give 100 kilos of bread. The remainder is water. Thus the "Notices sur le service des subsistances militaires" estimate the production of flour from new wheat, bolted at 20 per 100, at 139.5 kilos of bread (p. 483). This shows that there is too much water in the military ration of bread. Moreover, the boltage is weak. Aimé Girard and Fleurent have proved that, to be wholly nutritive, bread should be made entirely from the kernel of the grain, the flour from which represents from 55 to 65 per 100 of its weight. In the time of Lagrange one pound of bread was estimated to one of wheat. "Wheat," he said, "loses in the grinding, as the removal of the bran takes from it a fourth of its weight; but the flour gains back a third of its weight when it is made into dough by adding water, a part of which remains in the bread." Since we have taken the military ration as a type, let us regard it from the point of view of production, according to the formula that 100 kilos of wheat equal 100 kilos of bread, although there is an increase through the process of bolting.

According to the *Enquête agricole* of 1892, we find that the department representing the greatest excess in production of wheat in proportion to its population is Eure-et-Loir, which had 906 hectolitres per 100 inhabitants. If I convert the hectolitres into quintals of 77 kilos each, I get a total of 697.62 quintals. But only 75 out of 100 inhabitants need to be provided with a ration of a kilo a day. The proportion is thus increased by a fourth and brought up to 883 quintals per 100 inhabitants, or 883 kilos per each inhabitant. But the typical ration gives us 360 kilos a year. There is thus an excess of 523 kilos a year. The same calculation made for the other departments would prove that every department that does not produce at least 3½ hectolitres per inhabitant is condemned to unsufficient nourishment or must import it from districts which produce a much greater quantity. But there are 43 districts out of 87, or about half, of which this is true (*Statistique agricole*, 1892, the harvest in that year yielding 117,500,000 hectolitres). The average production of wheat from 1892 to 1903 was about 88,144,000 quintals. I have not deducted from this the 5 or 6 million quintals used for industrial purposes. I do not take for granted, moreover, that there is a certain amount of it used as fodder, and have deducted only the quantity necessary for seed. According to the work of Mr. C. V. Garola, director of the Agricultural Station of Chartres, *Les Céréales* (1894), an average of 206 litres of wheat is sown to the hectare, which, at a weight of 77 kilos per hectolitre, is equal to 160 kilos per hectare.

The average area of land sown in wheat from 1892 to 1903 was about 6,563,000 hectares, which gives us 10½ millions quintals. Thus 77,644,000 quintals are available for food,—in round numbers, 78,000,000.

We have then, according to the formula given above, 1 kilogram of bread per day = 360 kilograms of bread per year × 30,000,000 of rations = 10,800,000 tons, and, consequently, a deficit of 3,000,000 tons of wheat, nearly 29

per 100 inhabitants. It is true that there are some inferior grains which are used in part for food. According to the figures for 1902, rye yielded 1,159 tons; barley, 947,000 tons. Yet they hardly entered directly into the nutritive ration. Buckwheat yielded 578,000 tons, but it represents the poorest kind of nutrition.

The crop of potatoes was in 1902 about 11,200,000 tons; but it can be estimated that 5,000,000 were used for animal fodder, industrial purposes, distillation, and seed. On the other hand, according to the table given by Mr. Armand Gautier, out of 100 parts of new wheat the French and foreign wheats give on an average 12.64 of albuminoid matter; potatoes, 1.3. In short, to obtain the same quantity of albuminoids, 972 tons of potatoes are necessary as against 100 tons of wheat. To obtain the equivalent of protein substances furnished by 1,000,000 tons of wheat, 9,720,000 tons of potatoes are required. There were lacking 3,000,000 tons in the wheat crop, or 29 per 100. Counting the barley and buckwheat as equal to wheat, we have 1,000,000 tons of these poorer grains. Potatoes give an equivalent of less than a million. But the addition of these figures still leaves a deficit of a million, or about 10 per 100.

Vegetables ought to be considered separately; for in the military ration they are added to the bread, and do not take its place.

The crop of beans in 1902 was about 96,000 tons; of lentils, 84,000; of peas, 53,000; of French beans, 92,000,—a total of 325,000 tons. All these vegetables, not counting the waste, contain an enormous quantity of water. They cannot be regarded as the equivalents of wheat of the same weight.

Notwithstanding all the substitutes used by the French for wheat, the best proof that they need foreign grain is that they have continued to import it after the duty of 7 fr. was imposed in 1894.

	Grains Tons.
1895	450,000
1897	526,000
1898	1,945,000
1899	130,000
1902	245,000
1903	465,000

When crops are abundant, the tax plays only a limited part. As competition grew in the interior, the market price broke. But, as soon as a shortage in grain was apprehended, prices rose in the protected countries to a degree which sent the price of the commodity way beyond the natural rate.

Here is the proof borrowed from the *Memoranda of the Board of Trade*, published in 1903:—

Prices per quarter in	*United Kingdom.*	*France.*	*Germany.*	*United States.*
		(Shillings and pence.)		
1882	45.1	44.11	45.4	44.0

English and German prices are higher than prices in France were during the last year of free trade (namely, 1861), when the duty of 60 centimes per 100 kilos was imposed. In 1883 the tax was raised to 3 fr. We find the following prices:—

United Kingdom.	*France.*	*Germany.*	*United States.*
41.7	44.3	40.3	38.6

The price of wheat fell; it fell in England, the United States, and Germany, the difference being in our favor in 1882 compared with the price in Great Britain: it is now to our loss by nearly 3*s*.

In 1887 the tax was raised to 5 fr. in France, and in Germany to 5 marks per 100 kilos. We find the following prices:—

United Kingdom.	*France.*	*Germany.*	*United States*
31.10	43.9	37.11	31.9

In 1894 we had a duty of 7 fr., and Germany lowered its tariff to 3 marks 90 pf. It resulted in the following differences:—

PRICES IN

	United Kingdom.	France.	Germany.	United States.
	s. d.	*s. d.*	*s. d.*	*s. d.*
1895	23.1	32.9	30.6	22.4
1897	30.2	43.9	36.0	31.1
1898	34.0	45.8	40.6	31.9
1902	28.1	38.0	35.9	27.1

The tax of 7 fr. per metric quintal equals per imperial quarter 12*s.* 2½*d.*

It is seen that in 1897, a year of bad crops, the tax had more than its full effect, the difference being 30.2 and 43.9, or 13*s.* 7*d.*

May 4, 1898, M. Meline suspended the tax of 7 fr. on grains. In the report which preceded the decree he said, "In a few days we have seen the price of wheat rise from 30 to 33 and even 34 fr."

May 1, 1903, the price of wheat in Paris was 25 fr.; in London, 16.50; in Vienna, 16.80; in Budapest, 16.40; in Antwerp, 16.50; in New York, 15.94. The difference between London and Paris was, then, 8.50 fr. instead of 7 fr.

It can be said upon the authority of general experience that the tax on grains cannot raise the price of grain to its normal level in abundant years; and, on the contrary, it raises it above its normal level in poor years.

The merchants of the protected countries do not dare to buy: they prefer to wait. Furthermore, in France they fear the suspension of the tax; and thus the very persons cause the high prices who ought to lower them, for they do not provide the market. Then occur bread riots at the bakeshops. The mayors are asked to impose a tax to force them to sell their products at more reasonable price. But manufacturers are not in business in order to be ruined; and, when the mayor listens to these requests, the baker lowers the quality of his flour, and, as he knows that the sphere is a bulk with the least surface, he makes his

loaves round in order to use the greatest possible quantity of water.

It can thus be said that, powerless to completely protect the grain in abundant years, the duty becomes ruinous in the years of scarcity; and whom does it injure? Laborers, the poor, all those who subsist on the least varied diet, and who, obliged to do physical labor, have not only need of nourishment sufficient for maintenance, but sufficient for work.

V. Grain of the World.

If the production of grain is insufficient in an agricultural country like France, what is the case in the rest of the world? Here is the report of Levasseur on the statistics of agriculture, showing the production of wheat of the world:—

Year.	Country.	Wheat, Quintals per 100 Hectares.	Wheat, Quintals per 100 Inhabitants.
1900	Great Britain	78	39
1900	Ireland	8	40
1899	Netherlands	67	27
1900	Belgium	200	57
1900	France	233	230
1900	German Empire	109	68
1900	Austria	60	43
1900	Hungary	191	215
1900	Italy	217	108
1900	Roumania	254	254
1900	Russia	48	87
1900	Sweden	30	29
1900	Norway	11	4
1900	Denmark	36	42
1900	United States	51	186
1900–1901	Uruguay	—	15
1899–1900	Argentine Republic	—	463
	Average	106	112

Maize—of which Hungary raises 193 quintals per 100 inhabitants (without deduction of the fourth), Roumania,

366 quintals, the United States, 701 quintals—is beginning to be substituted for wheat. We ought to add a fourth of the production of wheat to the number of the population in order to get at the typical ration of the adult; we have then $112 + 28 = 140$ quintals per inhabitant. But the typical ration of a kilogram of bread per day and per capita would demand 360 quintals. The deficit is thus about 220.

Notice that this table includes wheat-exporting countries, like Hungary, Russia, Roumania, the United States, and the Argentine Republic. But, if Russia can export, it is for the reason that the largest part of her population does not use wheat. She has only 87 quintals per 100 inhabitants. Adding to this one-fourth to make up for the reduction of one-fourth of the inhabitants, we have 108 quintals per 100 inhabitants, making a deficit of 252 quintals. Out of the 132.5 millions of acres of land cultivated in European Russia, the amount devoted to wheat occupies only 12.5 millions of acres, that of rye, 28.7 million acres.

The entire region of Chernozem is cultivated, and its area cannot be extended. However fertile this black earth may be, sown thickly, 0 m. 30 centimetres to 1 metre, extensive cultivation yields only 4 or 5 grains of wheat or rye per seed. Russia exports four-fifths of her wheat crop.

In Germany 85 quintals of wheat per 100 inhabitants leaves a deficit of 275 quintals, which is not counterbalanced by the production of rye.

Except the Argentine Republic there is no country which produces a quantity of wheat sufficient to make up the typical ration of the French soldier.

According to the *Evening Corn List* the world's production during the best and poorest years is as follows:—

Year.	Million Tons.
1887	52.1
1888	61.8
1892	65.6
1894	70.0
1897	61.7
1898	78.0
1900	67.0
1901	79.7
1902	84.6
1903	86.1
1904	81.6

For the last three years the *Evening Corn List* gives the following table:—

Country.	In Thousand Hectolitres.		
	1904.	1903.	1902.
Austria	14,500	16,675	17,980
Hungary	49,300	62,930	66,120
Belgium	5,075	4,350	5,075
Bulgaria	13,050	13,050	14,500
Denmark	1,450	1,450	1,160
France	116,000	132,240	120,350
Germany	52,200	47,850	51,910
Greece	2,175	2,175	2,175
Holland	2,175	2,175	2,175
Italy	49,300	58,000	46,400
Portugal	2,030	2,175	2,175
Roumania	17,400	26,100	28,710
Russia	139,200	159,500	159,500
Caucasus	21,750	24,650	26,100
Servia	11,600	13,050	12,615
Spain	34,800	36,250	38,150
Sweden	1,450	1,450	1,450
Switzerland	1,450	1,450	1,450
European Turkey	13,050	14,500	14,500
United Kingdom	14,500	17,400	21,025
Total for Europe	562,455	637,420	634,520

Country.	In Thousand Hectolitres.		
	1904.	1903.	1902.
Algeria	9,425	8,700	10,150
Tunis	3,625	1,957	2,900
Argentine Republic	43,500	43,500	36,250
Australia	21,750	29,000	7,250
Asia Minor	13,050	12,325	14,500
Canada	31,900	38,275	34,800
Cape Colony	1,450	1,450	1,450
Chile	5,800	4,350	4,350
Egypt	4,350	4,350	4,350
India	127,600	106,575	81,200
Persia	8,700	8,700	7,250
Syria	7,250	8,700	7,250
United States of America	211,700	217,500	246,500
Uruguay	3,625	2,900	2,465
Mexico	4,350	3,625	3,045
Countries outside Europe	498,075	481,907	463,710
Grand total	1,060,530	1,119,327	1,098,230

If we separate the crops of Europe and those of countries outside Europe, we find:—

Year.	In Thousand Hectolitres.		
	Europe.	Outside Europe.	Totals.
1899	559,990	430,215	990,205
1900	548,462	402,230	950,692
1901	549,898	486,475	1,036,373
1902	634,520	463,710	1,098,230
1903	637,420	481,907	1,119,327
1904	562,455	498,075	1,060,530

It is shown in this table that the European countries produce most wheat. In the last three years the average production of Europe has been 611,500,000 hectolitres, about 55 per cent. out of an average crop of 1,092,000,000 hectolitres.

In round numbers 611,500,000 hectolitres of wheat give us 460,000,000 quintals. Reducing by a fourth the 400 millions of inhabitants of Europe, we have for each of them 1.1 quintals, while more than 3½ are needed. People who fear an overproduction of wheat may therefore be reassured. If Europe, even in prosperous times, could not procure wheat from other countries, she would suffer want. Germany was obliged in 1902 to import 2,202,000 tons of wheat; in 1903, 2,125,000 tons. She exported 262,000 and 347,000 tons. She produced 3,900,000 and 3,555,000 tons. She imported, then, more than 39 per cent. of her consumption.

The United Kingdom could not secure what was needed for its consumption without the aid of its colonies.

Year.	British Possessions.			Total of British Possessions. Tons.
	India. Tons.	Canada. Tons.	Australia. Tons.	
1895	440,000	255,000	179,000	874,000
1896	106,000	315,000	—	421,000
1897	20,000	347,000	—	376,000
1898	477,000	387,000	11,000	875,000
1899	410,000	436,000	151,000	1,032,000
1900	—	400,000	146,000	603,000
1901	167,000	429,000	310,000	975,000
1902	442,000	611,000	211,000	1,272,000

Year.	Foreign Countries.			Total of Foreign Countries. Tons.
	United States. Tons.	Argentine. Tons.	Russia. Tons.	
1895	2,266,000	572,000	1,153,000	4,489,000
1896	2,639,000	250,000	863,000	4,561,000
1897	2,707,000	47,000	756,000	4,058,000
1898	3,104,000	201,000	320,000	3,846,000
1899	3,011,000	576,000	126,000	3,893,000
1900	2,871,000	938,000	225,000	4,327,000
1901	3,343,000	415,000	129,000	4,078,000
1902	3,240,000	227,000	331,000	4,124,000

The production of wheat in the United Kingdom in 1903 was:—

In tons	1,299,000
The importation	4,406,000
Total	5,705,000

or less than 6 million tons, a deficit of 4 or 5 million tons, according to the typical ration assumed for France.

The progress of the cultivation of wheat in the United States and the total production are exhibited in the following table:—

Year.	Acres. Millions.	Bushels. Millions.
1866	15.4	152
1902	50.0	748
1903	46.2	670
1904	—	638

The population in 1860 was 31.5 millions; in 1903, 76, an increase of about 141 per cent. The production of wheat has increased more rapidly than the population, but it is f nd that there have been backward steps.

In 1901 the United States exported 25 per cent. of its crop, retaining 3.95 bushels per inhabitant; in 1902, 6.50 bushels; in 1903, 5.81 bushels, an average of about 5.42, or nearly 2 hectolitres; in round numbers, 1½ quintals per inhabitant. If we increase this ration by a fourth, we have, in round numbers, 190 kilograms instead of 360,—a deficit of 170 kilograms, which is supplied by maize.

If we reduce the population of the world, placing it at 1,600 millions, by a fourth, thus bringing it to 1,200 millions, it is found that there was at its disposal in 1902-04, an average year, in round numbers, 1,100 millions of quintals of wheat, about 91.6 kilograms, or less than a quintal per capita. If we consider that the French soldier's ration is represented by 400, that of the rest of the world is 100.

Wheat, then, is not in abundance. The human race, far from being surfeited with it, has not the necessary amount. It suffices to cast a glance over a planisphere showing the cultivation of the principal staples to observe that wheat-raising extends only over a very small area of the world. In the north of Germany wheat is replaced by rye, although it is cultivated farther north, both in Canada and Siberia. In the south, wheat is raised only in the northern part of India; and in the other hemisphere one must go south as far as Africa, the southern part of Australia, and the Argentine Republic, to find it.

The French, German, and English farmers who fear the influx of foreign wheat have never understood the difference between the production of wheat and the amount necessary for consumption. Among the wheat producers there are still many who are in the position of the peasant of La Bruyère.

VI. Meat in France.

Since the *Statistique agricole annuelle* does not give the average of butcher's meat produced, I take the figures furnished by the *Statistique agricole* for 1892 (p. 804, etc.).

Tons of meat of native stock delivered to the butcher:—

Beef	720,810 tons
Mutton	125,868 "
	846,000 "

In round numbers, 850,000 tons. But we have to provide 300 grams of untrimmed meat during 360 days for each of the 30 million inhabitants.

360 × 300 grams = 108 kilograms per year. For 30 million persons:
30,000,000 × 108 = 3,240,000 tons of meat.
Beef and mutton give us 846,000 tons of meat.
Deficit, 2,394,000 tons.

Pork to the amount of 461,000 tons must be added. We have seen that in times of peace the military ration of salt

pork is 240 grams a day, but we should not include 461,000 tons of fresh pork in this reduction.

We then have:—

Butcher's meat	846,000 tons
Pork	461,600 "
Total	1,308,000 "

We have now provided for 3,240,000 rations: deficit, 1,930,000 tons, or 59 per 100.

In short, while we need 100 kilos of meat, we actually have 41. Lagrange estimated that the total consumption of meat in France was 80 pounds per capita, or about 49 kilos. More than a century later we obtain the following figures:—

$$\frac{1,308,000}{30,000,000} = 43.6 \text{ kil. per inhabitant.}$$

Is the progress in the consumption of meat in proportion to the progress of civilization made during a century?

The 5,000 to 6,000 tons of goat flesh, the 12,000 tons of horse flesh, the 36 millions of different species of fish, the 10 millions of poultry, 15 millions of rabbits, make up the quantities that I have omitted, and serve to modify the percentage under consideration to the extent of not more than 2 or 3 per 100 at the most.

Let us add fish to animal foods. According to the fish statistics for 1899, 1900, 1901, the quantity of the several kinds of salt-water fish varied between 260,000 and 280,000 tons. Adding further fresh-water fish and allowing for quantities of fish products that cannot be estimated, we get about 300,000 tons.

We must, however, deduct from this number about 40,000 tons that are exported, of which 28,000 are codfish,—thanks to a system of bounties! It can thus be said that consumption is helped out by fish to the extent of hardly more than 250,000 tons. If we make the liberal allowance of 300,000 tons, and estimate what is certainly an exaggeration of some-

thing less than a third, that the nutritive value of fish is equal to that of meat, we get 1,608,000 tons. As the necessary ration is 3,240,000 tons, the deficit is 1,632,000 tons, or 53 per 100. While 100 kilos of animal food is required, we have only 47.

The *Statistique agricole* of 1902 estimates the produce of a hen at 80 eggs per year, and the total production of eggs at 2,885,000,000 (p. 316). If the weight of an egg is estimated at 60 grams (shell included), we have for all France 173,000 tons of eggs.

M. Armand Gautier estimates that from 1890 to 1899 the average consumption of eggs by each Parisian, without distinction of age or sex, was 10 kilos of eggs. If we include 10 kilos of eggs in each of the 3,240,000 rations of animal food, the deficit in nutriment from animal matter would still be nearly half the necessary amount.

Lagrange added cheese as a substitute for meat, at the rate of a half-pound of cheese for one pound of meat; and modern writers confirm this proportion, which is, however, exaggerated for cheese in general. In 1892 the production of cheese was about 136,650 tons, not counting the amount exported. I double these 136,650 tons, and add to the ration of meat and fish 273,000 tons.

I do not include butter, which, though very rich in fat, does not contain nearly as much protein substance. When all the possible substitutes have been added to the quantity of butcher's meat and pork available according to the *Statistique agricole*, we always find a varying deficit of about 50 per 100. We can therefore maintain that in France we have only half of the requisite animal food.

VII. Increase of the Urban Population and of Animal Food.

An increase in the consumption of meat is a result of comfortable circumstances; and, if it is found that in cities the consumption of meat has not increased to the same extent as the population, the conclusion follows that meat is too expensive, and that custom duties which have been constantly increased since 1881 have their share of responsibility for this decrease in consumption. In Paris the consumption of butcher's meat has diminished in proportion to the population.

	Population.	Consumption of Butcher's Meat. Tons.	Increase in Population. Per Cent.	Increase in Consumption of Meat. Per Cent.	Kilos per Capita.
1880:					
Census of 1876 . . .	1,988.000	149,600	—	—	79
1902:					
Census of 1901 . . .	2,657,000	165,500	33	10	62
Census of 1903 . . .	—	161,762	—	8	60

Thus, while the population has increased 33 per cent., the consumption of meat has increased from 1880 to 1903 only 8 per 100; and the tariff act of July 31, 1903, was a factor in the decreased consumption of 1900 as compared with 1902.

We must add pork, poultry, game, and fish to the consumption of butcher's meat. Has this consumption increased more or less rapidly than the population?

Year.	Pork and Pork Products.	Per Cent. Increase.	Poultry and Game.	Per Cent. Increase.	Fish.	Per Cent. Increase.
1880	25,500	—	21,715	—	3,954	
1902	32,520	28	29,811	6	4,067	
1903	34.218	24	30.871	42	4.004	0.1

While the increase in population was 33 per cent., the consumption of pork relatively fell off in 1902, but became a little higher in 1903. Pork was probably substituted as food for meat of higher price in some families to compensate for the shortage of 4,000,000 tons of meat. The consumption of meat remained stationary from 1880 to 1903.

The increase in the consumption of poultry and game alone presents a greater increase than the population, but these foods rank as luxuries. The yearly ration of an adult in Paris is only 87 kilos of meat instead of the 108 kilos of the soldier. Here, then, has been no progress, but, on the other hand, a distinct retrogression.

I have made an inquiry through the mayors of some of the most progressive cities in France in order to bring the population and the consumption of butcher's meat and animal food into comparison.

Cities in which the increase of animal food has been greater than the increase of population:—

	Population.		Butcher's Meat. Tons.		Total of Animal Food. Tons.		Increase.			Per Inhabitant. Kilo.	
	1880.	1903.	1880.	1903.	1880.	1903.	Population. Per Cent.	Meat. Per Cent.	Animal Food. Per Cent.	Meat. 1903.	Animal Food. 1903.
Angoulême	30.500	37.600	2.637	3.339	3.014	3.903	23	26	29	88	103
Montluçon	24.000	35.000	697	953	908	1.479	45	60	62	27	42
St Quentin	39.000	50.200	1.140	1.878	1.975	3.096	29	64	56	37	61
Toulouse	111.300	127.800	*392	483	——	——	14	23	—	3	—

* These figures are for 1891.

46707

Cities in which the increase of animal food has been less than the increase of population:—

Cities	Population.		Butcher's Meat. Tons.		Animal Food. Tons.		Increase.			Per Inhabitant. Kilog.	
	1880.	1903.	1880.	1903.	1880.	1903.	Population in Per Cent.	Meat in Per Cent.	Animal Food in Per Cent.	1880.	1903.
Amiens	61,900	82,700	5,752	6,180	——	——	33	.7	——	74	—
Bordeaux	212,000	256,700	23,183	21,270	27,634	26,586	20	–8.26	–3.70	82	103
Bourges	25,200	35,900	1,546	1,547	2,175	2,450	42	0.7	12	43	6
Grenoble	44,000	39,400	4,600	5,682	5,441	7,022	35	21	29	95	11
Lille	162,700	215,400	9,551	10,264	10,698	11,736*	32	7	9	47	54
Limoges	47,500	70,500	7,100	8,812	——	——	48	24	—	124	—
Lyons	376,600	459,000	20,046	19,331	——	——	21	–3.45	—	43	—
Marseilles	273,600	491,000	26,102	30,054	——	——	78	15	—	60	—
Nantes	116,000	124,000	4,262	4,075	7,502	9,320	6	–4	24	32	75
Nîmes	60,800	72,900	5,929	5,746	6,637	6,780	19	–3	2	78	93
Rennes	44,500	61,000	3,485	3,629	——	——	37	3	—	61	—
Roubaix	83,300	124,000	3,280	4,423	4,800	5,915	49	44	23	35	47

* Not including poultry.

It will be seen that, with the exception of Angoulême, an increase in consumption of butcher's meat and animal food has occurred only in the cities where consumption was low.

But, except in Bordeaux, Angoulême, and Nîmes, this consumption never reached the 108 kilograms which, at 300 grams per day for three-fourths of the population, constitutes the typical soldier's ration.

In Toulouse the figures for butcher's meat are surprisingly small; namely, 483,000 kilos per 127,000 inhabitants, or 3 kilos per capita!

I know it is said that the rural dweller who moves to the city is used to less meat than the city dweller who has always lived in cities. Consequently, the increase in the use of animal foods should for this reason show a certain diminution compared with the increase in population. But, even taking into account this fact, we find so great a difference in certain cities, like Lyons and Marseilles, that it is difficult not to maintain that consumption has decreased. It can be said, therefore, that the high price of meat is a factor in the falling off in meat consumption.

But the duties are the one reason for the current prices. From 1863 to Nov. 3, 1881, meat was imported free of duty. A duty of 3 fr. was then imposed. The decree of Jan. 11, 1892, raised the tax to 25 fr. per 100 kilos, net weight of beef, 32 fr. on mutton, 12 fr. on pork. The decree of April, 1898, raised it to 18 fr. on pork, and the decree of July, 1903, to 35 fr. on beef and mutton and to 25 fr. on pork. The average price of meat at the Villette market, from Aug. 1–5, 1904, was (average of three qualities):—

Year.	Beef.	Veal.	Mutton.	Pork.
1904	1.40	1.68	2.01	1.41
1903	1.38	1.62	1.97	1.55
1902	1.30	1.54	1.92	1.57
1901	1.30	1.81	1.89	1.51
1900	1.20	1.58	1.80	1.47

Pork was the only article which showed a slight tendency to a lower price.

VIII. Price of Food in New England Cities.

Mr. Atwater has compiled food tables giving the value in calories per pound. For the commonest articles of food he has given the percentage of waste and water forming the total of undigested foods; the percentage of protein substances, fat, hydrates of carbon, and the calorie value of each article of food per pound.

Later, in conformity with the results of dietary studies in families in the chief cities and in certain population groups in the United States, his assistants have estimated the price of food compared to its nutritive value.

I take the following table from R. D. Milner's work, "Prix de l'Aliment relativement à sa Valeur nutritive" (1902 edition). The prices are the ordinary market prices in New England cities.

COMPARATIVE VALUE AND PRICE OF FOOD.

Kind of Food.	Price per Pound. Cents.	10 Cents will Buy.	
		Protein Substances. Pounds.	Energy. Calories.
Beef (filet)	25	0.064	.415
Beef (rib)	20	.081	.520
Beef (rump)	16	.088	.730
Beef (round)	12	.129	.765
Beef (culotte)	12	.114	.925
Beef (brisket)	6	.230	2.150
Veal	23	.089	.310
Mutton (leg)	14	.107	.640
Mutton (shoulder)	12	.090	1.120
Smoked ham	20	.071	.840
Bacon	14	.065	1.985
Fresh ham	12	.112	1.120
Salt pork	10	.019	3.670
Turkey	18	.092	.600
Chicken	15	.092	.520
Sausage	10	.130	2.125
Fresh salmon	35	.040	.175
Canned salmon	15	.146	.615
Fresh mackerel	12	.096	.305
Salt mackerel	8	.204	1.290
Salt codfish	9	.211	.350
Canned lobster	35	.052	.125
Fresh lobster	16	.037	.900
Oysters	18	.030	.130
Butter	28	.004	1.300
Eggs (dozen)	16	.083	.400
Cheese	16	.163	1.230
Unskimmed milk	3	.110	1.080
Cream	15	.034	1.220
Dried peas	4	.562	4.010
Green peas	3	.105	.850
Onions	3	.047	.685
Cauliflower	2.5	.043	.560
Cabbage	2.5	.056	.500
Potatoes	1.5	.120	2.070
Turnips	.1	.090	1.250
Rice	.8	.100	2.040
White bread	.5	.184	2.430
Wheat bread	.3	.380	5.490
Rye bread	.3	.227	5.480
Sugar	.6	—	3.130
Olive oil	.75	—	.565
Dates	.10	.019	1.095
Prunes	.10	.018	1.190
Raisins	.10	.033	1.120
Pears	.3	.029	.380
Apples	1.5	.027	.930

Comparing in detail New England city prices with Paris prices, we can get at the cost of the ration. If we reckon that the pound of 453 grams represents nine-tenths of a French half-kilogram, we reduce the price of filet of beef from 2.50 fr. to 2.25 fr.; the price of rib of beef from 2.20 fr. to 1.98 fr.; leg of mutton from 1.40 fr. to 1.26 fr.

If we compare French and American prices per 100, we find the French price for filet is higher by 80 per cent.; for rib by 98 per cent.; for leg of mutton by 80 per cent. Therefore, the amount of protein substances and calories that I could buy in the cities of the United States for 10 cents (50 centimes) would in Paris cost 0.90 centimes, 0.99 centimes, and 0.90 centimes, respectively.

The same calculation can be made for all the other foods I have enumerated in the above table. Any housekeeper can compare New England city prices and those of Paris on the basis of this table.

An adult in Paris, taking a moderate amount of exercise, would not have half his necessary ration by paying 2.79 fr. for the specified cuts of meat.

According to the study of five groups in Chicago, we give the cost of living for one workman per day:—

	Average per Day. Cents.	Protein Substances.	Calories.
(*a*) Americans	26.1	117	3,623
(*b*) Americans of German descent	21.0	109	3,070
(*c*) Germans	24.8	125	3,552
(*d*) Irish	25.9	131	3,660

The average price of food is thus 1.25 fr. to 1.30 fr.

In New York the dietary studies made by Mr. Atwater and Mr. P. Bryant, using the same methods, give the following results for 6 groups of men:—

	Cents.	Protein Substances. Grams.	Calories.
Group A, less than 13 cents per day, average . . .	11	75	2,151
Group B, from 13 to 16 cents, average	15	94	2,779
Group C, from 17 to 20 cents	18	103	2,944
Group D, from 21 to 23 cents	22	125	3,514
Group E, from 25 to 28 cents	26	138	3,864
Group F, more than 28 cents	38	178	5,432

It is evident that the men in group A are far from having a ration sufficient for sustenance, much less for enduring labor.

These figures prove that there are persons in Chicago and New York who live very scantily, but that for 1.30 fr. they can secure a ration much superior to that of the French soldier, and for 1.90 fr. a luxurious one.

The high cost of living in the cities of the United States should be studied in connection with the high cost of living in England.

IX. Consumption of Meat in the United Kingdom.

The production of animal food in the United Kingdom is not sufficient for its consumption.

According to an inquiry made in November, 1900, by a committee appointed by the Royal Statistical Society to estimate the production and consumption of meat and milk in Great Britain, the average yearly quantity of meat consumed and produced during the five years ending May 31, 1903, was as follows:—

	Tons.
Beef and veal	662,520
Mutton	313,822
Pork and ham	269,578
	1,245,920

We learned that the production in France was 1,308,000 tons. The English ton is equal to 1,016 kilos. But, since the

population of Great Britain exceeds 41,000,000, the deficit would be greater than in France. If 100 kilos of meat were necessary, they would have less than 40 kilos.

The table of per capita consumption gives 67.5 pounds, which equals 30 kilos, 577 grams. But, as we count the consumption of only three-fourths of the population, we must increase the ration by a fourth to obtain the same ration employed for France. We get thus 38 kilos, 220 grams.

The consumption of imported meat is given as 54.3 lbs. per capita, about one-fifth less than the home product. We thus get 30 kilos, 600 grams. Imported meat gave 961,905 tons, or 54.24 lbs. per capita. The total is 2,207,000 tons.

The total English ration calculated on the same basis as the ration considered typical for France is 68 kilos, 800 grams; in round numbers, 69 kilos, exceeding that of France by 25.4 kilos.

This amount of 2,207,000 tons leaves a deficit of more than 1,000,000 tons. While in France the deficit is at least 50 per cent., in the United Kingdom it is only 30 per cent., thanks to the exemption from import duty on meat. These figures prove that the English are wise in increasing the area of their meadows, since they provide for only 56 per cent. of the consumption of their population, while an additional 30 per cent. is needed.

In the second report of the committee we get the subdivisions of consumption of meat per capita in England:—

		Pounds per Capita and per Year.
Group I.	Laborers, mechanics, farm hands	107
" II.	Population of small means	122
" III.	Population of moderate means	182
" IV.	Population of large means	300

Again we should note carefully these groups. It is evident that those having to expend the greatest physical energy can, with the least success, make good this loss. They have less than 69 kilos of meat, and the French soldier's ration is 108.

X. Amount of Animal Food in the World.

I take from M. Levasseur's analysis of "Les Procédés de la Statistique Agricole" the following table of domestic animals, and compare it with the population of different countries taken from the Census of 1900:—

COMPARATIVE STATEMENT SHOWING THE AVERAGE NUMBER OF DOMESTIC ANIMALS FOR THE DECADE 1891–1900.

(In Millions of Heads.)

Countries.	Cattle.	Sheep.	Hogs.	Inhabitants. Millions.
Great Britain	6.6	27.0	2.5	41
Ireland	4.4	4.3	1.3	
Netherlands	1.5	0.7	1.1	5
Belgium	1.5	3.24	1.0	7
France	13.3	21.1	6.2	39
German Empire	18.3	11.4	14.5	56
Austria	9.0	2.9	4.1	45.4
Hungary	6.7	8.1	7.3	
Italy	5.0	6.9	1.8	33
Roumania	2.5	5.0	0.9	6
Russia (European)	30.3	47.2	11.2	100
Sweden	2.5	1.3	0.7	5
Norway	1.0	1.2	0.1	2
Denmark	1.7	1.2	1.0	2.5
United States (according to the Census of 1900)	67.8	61.6	62.9	80
Totals	172.1	200.14	116.7	322

What food resources do these figures indicate? What weight of meat does each of these animals represent? The committee of the Royal Statistical Society, after very careful study, reached the following conclusions: an ox is equal to 660 lbs. of meat; a calf, 95 lbs.; a sheep, 65 lbs.; a lamb, 40 lbs.; and a hog, 135 lbs.

But the English products are of much better quality than those of other countries. Furthermore, the oxen and calves are lumped together as well as the sheep and the lambs. In order to obtain an average weight, I have deducted a fourth

of the weight for the English cattle and sheep as given by the committee. I deduct, however, only a fifth of the weight of hogs, with the following results:—

	Weight in Kilos.	Millions of Heads. Multiplied by	Metric Tons of Meat.
Cattle	224	172	38,528,000
Sheep	21.5	200	4,300,000
Hogs	50	116	5,800,000

But this amount is not annually at hand. It was necessary to take a period of five years for beef, of four years for mutton, and of two years for pork, which gives us:—

Cattle	7,700,000	tons annually.
Sheep	1,080,000	" "
Hogs	2,900,000	" "
Total	11,680,000	" "

We should deduct a fourth of the 322 million inhabitants used in this table, or about 80. We then have:—

$$\frac{\text{Tons of meat, 11,600,000 kil.}}{\text{Number of inhabitants, 242,000,000}} = 48 \text{ kilos.}$$

$$\frac{\text{Kilos}}{\text{Number of days}}\ \frac{48}{360} = 133 \text{ grams per day.}$$

It will be remembered that the French military ration is 300 grams. The discrepancy is therefore 167 grams. If the inhabitants of these countries were to have a ration equal to that of the French soldier, 225 grams would have to be added to every 100 that they really have.

By taking the figures compiled under the auspices of the committee of the Royal Statistical Society, I get the following table of the average consumption of *meat* and products of the dairy in different countries:—

	Meat. Pounds.	Milk. Gallons.	Cheese. Pounds.	Butter. Pounds.
United Kingdom	122	15	10.5	18.5
Denmark	76	40	—	20.0
France	80	16	8.2	5.9
Germany	99	—	—	—
Saxony	—	46	—	33.0
Belgium	70	—	—	25.0
Holland	—	—	11.0	13.0
Sweden	62	40	4.6	15.8
United States	150	25	3.7	20.5
Australia	262	—	3.5	16.7
New Zealand	212	—	4.4	17.8

The figures of 150 pounds of meat for the United States give us 67 kilos, 5 grams. Increased by a fourth to get the figure for the adult's ration, we have 83 kilos, 3 grams, per year instead of the 108 kilos of the typical ration. This figure is exceeded only in Australia and New Zealand. For Australia we have 118 kilos, which, increased by a fourth, gives 156 kilos per adult ration.

XI. Population and Foods.

In England, Major Craigie, president of the Royal Statistical Society in 1903 and 1904, has called the attention of his colleagues to the enormous increase in the world's population. It has not doubled in twenty-five years; but he estimates with most other statisticians that it has nearly doubled in the last seventy years, increasing from 850 millions to 1,600 millions, the estimate of M. Levasseur and M. Bodio.

Increase in Population from about	1830 to 1900. In Millions.	
Europe	216	400
Asia	480	868
Africa	109	178
America	40	148
Oceanica	2	6
	847	1,600

Russia's population is included in the figures for Europe. Its population has probably increased 150 per cent. in seventy years, and that of the rest of Europe 67 per cent.; but up to 1897 she had no census that could be trusted. Excluding Russia, the population of Europe has increased by more than one-half.

POPULATION.

Countries.	1830.	1900.	Per Cent. of Increase in 70 Years.
United Kingdom	24.4	41.6	70.5
France	32.5	38.9	19.7
Germany	30.0	56.4	88.0
Austria-Hungary	30.0	45.4	51.3
Italy and Switzerland	23.2	35.8	54.3
Spain and Portugal	14.2	23.1	62.7
Sweden, Norway, Denmark, Belgium, and Holland	12.4	21.7	75.0
	166.7	262.9	57.7

We have seen that, in spite of the progress of agriculture, sufficient food could not be produced.

XII. The Economic Oligarchy in France.

That it exists is to the condemnation of German, French, and Belgium agrarians. They intend to get a monopoly of the food consumed by their countrymen, and they are incapable of securing it.

I refer to the distinction made between protective and fiscal tariff.

A fiscal tariff, such as was established in England in 1860, strikes only at the articles which the country does not produce. The entire receipts go into the treasury to provide for expenses of public interests.

A protective tariff is, on the contrary, fixed on articles produced by the country. The object is not to increase the receipts of the treasury, but to raise the price of articles produced, and consequently to make all consumers of these

products pay the difference between the natural market price and the price obtained by means of this device.

The duty on wheat proposes to raise the price of all quintals of wheat which are on the market 7 francs; and 0.07 centimes a kilo of wheat = 0.7 centimes a kilo of bread. Thus every loaf of 2 kilos is taxed 14 centimes. We may estimate at 70 millions the quintals of wheat imported into France subject to the customs duty. If the full expectation of 1897 and 1898 had been realized, the consumers would have paid an over-assessment of 490,000,000 francs. If the average tax were only 4.90 fr., or 5 fr., as fixed by M. des Essars, we get, year in and year out, a tax of 35 millions, which affects all persons obliged to buy their bread in proportion to the amount of bread they use. Although the price of meat continues to increase, a deputy, M. de Bussy, does not think sufficient the tax of 10 fr. on 100 kilos of beef, live weight, and 15.50 fr. on 190 kilos of live-weight mutton. He secured the necessary votes for the decision of July 31, 1903, fixing the tariff as follows:—

	Maximum Tariff.	*Minimum Tariff.*
Cattle, per 100 kil. (live weight)	30	20
Calves	40	25
Sheep	40	25
Hogs	25	15
Fresh meat: mutton	50	35
Beef	40	35
Pork	40	25
Ham	50	30

This tariff indicates that 20 fr. on live weight was considered equal to 35 fr. on fresh meat, not distinguishing between choice and poor cuts. At the minimum, then, the tariff affects fresh meat at the rate of 0.35 centimes a kilo, bones included, about 350 fr. a ton, which multiplied by 1,300,000 gives 450,000,000 francs. We have, therefore, more than 805,000,000 francs levied through the customs duty on bread and meat.

These 800 millions are added to the 300 millions of taxes

that we pay into the State Treasury, but the mysterious 800 millions that are added to the price of articles which every housewife must use daily, and the expenditure of which no one controls, are not used to insure the expenses of common interests. They are used for private revenue to guarantee and increase the income or profit of a certain number of persons who, in a country enjoying universal suffrage, more than a century after the Revolution had abolished feudal rights, have known how to uphold for their own profit this contradiction between private interests and sovereign rights. In some way they arrange for two salaries, a nominal and a real salary, the former being increased from the private or feudal tax, and imposed for the profit of land-owners and protected industries. Some large owners, calling themselves farmers, with as much reason as a householder letting a store to a grocer can claim to be a grocer, exclaim that, without a duty on cereals and meat, the land will lie fallow, agriculture be ruined, and farm hands be without work; and they are the self-same persons whose cry always is that the farms are short of laborers.

This argument, dating from 1819, has often been revamped. In 1851 M. Thiers made dire predictions of what would happen if a government should ever be bold enough to suppress the sliding scale (of taxes). But from 1861 to 1889 the duty on wheat was 60 centimes per 100 kilos. The number of hectares sown in wheat rose from 6 to 7 millions in 1869. It remained at this figure even after the war. The maximum crop was, under the régime of the sliding scale of taxes, 110 millions of hectolitres in 1857, 116 in 1863 and 1868. It rose to 121 in 1872, to 133 in 1874, to 122 in 1882, the last year of economic freedom for wheat. And since then, in spite of the duties of 3 fr., 5 fr., and 7 fr., and in spite of the progress of science, no crop has equalled that of 1874.

Let us admit that the French land proprietors would have been incapable of doing what the Danes did under pressure of competition.

Let us admit that, if the tax of 7 fr. had not existed, the owners of land which produced enough wheat to sell would have the 350 millions paid by the purchasers of wheat, and consequently by the consumers of bread.

Let us admit that, without the tax of 25 fr. per 100 kilos of fresh meat, increased to 35 fr. by the law of July 31, 1903, the owners of pastures would lose a sum that we estimate as equal to that paid by the consumers of wheat. This would be a loss of 700 millions to them. But the whole question is to find out who ought to bear the loss.

Should a deficit resulting from an accident, such as too much or too little rain, high price of fodder or low price of produce, home or foreign competition, ignorant cultivation of the soil, etc., be borne by land-owners, who also run the chance of improving the value of their land? or ought it to burden the persons who, having no share in the management of affairs, have no more interest in the chances of gain than in the risks of loss? What have the legislators done by placing a duty on wheat? They believe, perhaps, and have persuaded public opinion, which is ill-informed on economic questions, that they would obviate the loss resulting from foreign competition. Not at all. They have made the consumers of bread shoulder this possible loss; that is to say, the most numerous class whose diet is least varied, wage-earners of all kinds. And they have cut down the meat ration of those who ought to play the largest part in keeping up the population.

By aid of the law they have taken from the purse of those who by their daily labor ought to provide for themselves and their families, and to save part of their wages for a rainy day; and for whose profit? For the profit of the owners of 138,000 farms of more than 40 hectares, some of whom raise no wheat; for the profit again of the owners of 711,000 farms of from 10 to 40 hectares, not all of whom raise wheat. In other words, for the profit of a very small minority, since the owners of small farms under 10 hectares can hardly transport their wheat to market.

The 138,000 large estates include 10,143,000 hectares of arable land, perhaps of 73 hectares each on an average; the 711,000 medium-sized estates of 8,368,000 hectares, of about 11½ hectares each on an average.

On account of the necessary triennial rotation of crops, these can plant about 4 hectares in wheat at a time, reaping 45 quintals, of which they can sell about 35 without being obliged to buy for their own use. There are two classes of land-owning wheat sellers; but the 2,617,000 owners of land of from 1 to 10 hectares have all told only 6,654,000 hectares of arable land, less than 3 hectares apiece, of which 1 hectare at most can be put into wheat each year, and which will yield 14 to 15 quintals a hectare in good years, of which more than two-thirds must be kept for their own consumption. As for the 2,235,000 small owners of less than a hectare, who hold, all told, 719,000 hectares, they buy wheat and sell none.

Since many farmers who sell wheat buy baker's bread instead of making their own, they are sure to suffer a loss on account of the tariff; for the baker not only makes them pay the tax on the bread, but the wheat merchant, the miller, and the baker get also their profit out of the resulting high price of wheat. They do not distinguish in the price the part resulting from the tariff and that representing the normal cost.

If the tariff is equal to 4.90 per cent. per quintal, and the wheat merchant profits 10 per cent., the flour merchant 10 per cent., the baker 10 per cent., then the farmer who buys his meal has to pay for protection 30 per cent. of 4.90, or 1.47.

Is it in the interest of public well-being that the proposal of M. Debussy, made a law July 31, 1903, raised the duty on wheat? Is it for the benefit of the majority of families? Is it for the benefit of those who, dependent on their own physical exertions, need solid nourishment? No, it is always for the benefit of the owners of 138,000 large estates, consisting of 2,039,000 hectares of meadows; for the benefit of the

owners of the 711,000 medium-sized estates, which include 2,388,000 hectares of meadows. For the small property owners, having less than 10 hectares, number only 2,129,000.

	Arable Lands per 100 Hectares.	Total.	Meadows.	Total.
Small farms:				
Under 1 hectare	2.78	28.49	3.20	32.47
From 1 to 10 hectares	25.71		29.27	
Medium-sized or large farms:				
From 10 to 40 hectares . . .	32.33	71.51	36.43	67.53
Over 40 hectares	39.18		31.10	

Thus the medium-sized and large estates contain more than two-thirds of the meadow land and nearly three-fourths of the arable lands.

The agricultural tariff benefits only the smallest minority; and I mention the fact more gladly, as I belong to it.

XIII. Conclusions.

First. All protection tends to an oligarchy. It exists for the benefit of a privileged minority and at the expense of all.

Second. Agricultural protection in France burdens the population much more heavily because there is a shortage of 30 per cent. in wheat and of 50 per cent. per 100 in animal food, if we take the soldier's ration in time of peace as a standard for our adult ration.

Third. Agricultural protection can profit only the large land-owners.

Fourth. The cost of food in France is much higher than in the United States and Germany.

Fifth. The amount of wheat and meat produced in the world is much less than is required for food, as physiologists, including Atwater, have proved.

Sixth. The increase of population in Europe during the

last seventy years has been so great that without importations of wheat and meat it would be in want.

Seventh. Many who need nourishing food must have very insufficient nourishment.

Eighth. The relative decrease in the consumption of meat in a majority of the large French cities proves that evil results from the duty which actually raises the price 35 centimes per kilogram.

NOTE.

To the conclusions arrived at in regard to France, I add the following conclusions which especially concern the United States:—

First. The United States can increase their production of wheat and meat to an amount sufficient for their home consumption and for exportation.

If the continent of Europe by loss of capital should be forced to reduce its consumption on account of reduced purchasing power, it would have more and more need of nutritive articles, whatever may be the increase of its own agricultural production.

This the following table from the *Annual Review of Foreign Commerce* for the year ending June 30, 1904 (p. 23), proves:—

Years.	Exports of Wheat. In thousands.			Exports of Flour. In thousands.		
	To Europe.	Total Exports.	Per Cent. to Europe.	To Europe.	Total Exports.	Per Cent. to Europe.
	Bushels.	Bushels		Barrels.	Barrels.	
1894	83,987	88,415	94.99	11,840	16,859	70.23
1895	71,794	76,102	94.34	10,133	15,268	66.36
1896	52,908	60,650	87.24	9,201	14,620	62.94
1897	67,512	79,562	84.85	9,234	14,569	63.38
1898	135,547	148,231	91.44	10,608	15,349	69.11
1899	128,202	139,432	91.95	12,600	18,485	68.16
1900	96,995	101,950	95.14	12,665	18,699	67.73
1901	119,796	132,060	90.71	13,108	18,650	70.28
1902	140,338	154,856	90.63	11,826	17,759	66.60
1903	93,724	114,181	82.08	12,690	19,796	64.10
1904	40,245	44,230	90.99	10,534	16,999	61.97

Exportations diminished greatly in 1903 and 1904, but except in 1904 they are higher than in 1896 and 1897, but what should be noticed is the constancy of the proportion of wheat exported to Europe during these ten years, which has kept at about 90 per cent.

Second. The characteristic distinction between protection in the United States and protection in France and Germany is that in the latter countries it does not apply to other foodstuffs than wheat and meat. In addition the position of the American workman is vastly superior, since he can have at the lowest price the foodstuffs he most needs.

REVIEWS AND MISCELLANY.

DECLINE IN BIRTH-RATE AND MORTALITY OF INFANTS.

Report of the Royal Commission on the Decline of the Birth-rate and on the Mortality of Infants in New South Wales. Sydney, New South Wales, 1904.

T. A. Coghlan, the able government statistician of New South Wales, published in 1903 a little book entitled "The Decline in the Birth-rate of New South Wales and Other Phenomena of Child-birth." In this essay it was shown that a notable decline had occurred in recent years in the birth-rate of New South Wales. A careful compilation and analysis of all the available statistics bearing upon the subject led the author to conclude that the whole of the decline could not reasonably be accounted for by reference to natural causes. Mr. Coghlan stated in his concluding chapter: "It cannot be denied that the condition of affairs disclosed by several of the preceding chapters arises from a direct reversal of the ordinary canons of morality. . . . The existing facts are compatible with only one explanation; namely, that in the five years following 1880 the art of applying artificial checks to conception was successfully learnt, and has continued in operation to this day."

The immediate result of the publication of Coghlan's essay was the appointment by Edward VII. of a Royal Commission of twelve members to make "a diligent and full inquiry into the causes which have contributed to the decline in the birth-rate of New South Wales, and the effects of the restriction of child-bearing on the well-being of the community." This Commission was granted Aug. 13, 1903, and a report was called for within three months. A little later another member was added to the Commission, the scope of the inquiry was extended to include a general investigation of the mortality of infants, and the time limit set for making the report was extended to March 12, 1904.

In no other colony of Australasia and in few, if any, other countries are the statistics pertaining to births so admirably kept or so complete as in New South Wales. The Commission were fortunate in having the services of Mr. Coghlan, and in addition they were

able to call upon much other expert talent thoroughly versed in the matters to be investigated. A wealth of data, supplemented by the evidence of a large number of witnesses, and the conclusions of the Commission are now made public in a report of two volumes.

The fundamental fact with which the Commission were concerned is indicated by the following figures:—

LEGITIMATE BIRTHS PER 1,000 WOMEN, AGES 15–45.

NEW SOUTH WALES.

1886	339
1891	289
1901	235

BIRTHS PER 1,000 MARRIED WOMEN.*

Age of Mother.	1881.	1891.	1901.
20–24	458	416	397
25–29	405	354	299
30–34	339	292	227
35–39	274	236	173

Looked at from any point of view, the birth-rate of New South Wales has declined rapidly in recent years.

The report of the Commission on the causes of this decline fully confirms the conclusions which Coghlan had reached in 1903, and fully sustains his contention that other than natural causes have contributed to bring about this rapid fall in the birth-rate. Summing up the results of their inquiry, the Commission state: "In conclusion, we desire to reiterate our opinion that there has been a very serious decline in the birth-rate of New South Wales since the year 1889, and that this decline cannot, in any measure, be ascribed to any change in the physical characteristics of the people, nor in any material degree to other causes dependent upon natural law. On the other hand, we have been reluctantly, but inevitably, driven to the conclusion that the people, led astray by false and pernicious doctrine into the belief that personal interests and ambitions, a high

*The decrease in the number of births per 1,000 married women may perhaps be best shown by reducing the figures for 1891 and 1901 to a common basis, representing the numbers in 1881 as 100 at each specific age. The figures for 1891 and 1901 as thus restated are as follows:—

COMPARATIVE BIRTHS AMONG AN EQUAL NUMBER OF MARRIED WOMEN.

Age of Mother.	1881.	1891.	1901.
20-24	100	90.8	86.7
25-29	100	87.4	73.8
30-34	100	86.1	67.0
35-39	100	86.1	63.1

This restatement makes clear the fact that the decline in the birth-rate has been progressive from the lower to the higher ages of the married women.

standard of ease, comfort, and luxury, are the essential aims of life, and that these aims are best attained by refusing to accept the consequences which nature has ordained shall follow from marriage, have neglected and are neglecting their true duty to themselves, to their fellow-countrymen, and to posterity. . . . They seem to think that in the deliberate curtailing of reproduction they have found a panacea for the ills of life. . . . Already we see in the injury to health, the wrecking of life, which is manifesting itself, how Nature has begun to avenge herself on those who oppose her laws. We see, in the lessening of parental control, the commencement of dissolution in the family bond, and in the dwindling of the size of families, the dying out of Nature's best school for teaching the lessons of life and the weakening of the social structure at its base. . . . We find also that the practices and habits which the doctrines of limitation inculcate tend to undermine the morality of the people, to loosen the bonds of religion, and to obliterate the influence of those higher sentiments and sanctions for conduct with which the development of high national character has ever been associated. . . . We do not hesitate to declare that the doctrines which advocate and justify the deliberate restriction of child-bearing in marriage are vicious, and that Malthus was right in deprecating artificial checks to the growth of population on the ground of their viciousness."

The Commission state that they found the practice of "prevention" to be general among all classes, and that it has increased greatly during the last fifteen years. They consider it the principal factor in the declining birth-rate. Increasing knowledge of how "to prevent" and the ease with which the means can be secured, coupled with the lessening of the strength of religious feeling, are given as the reasons why this practice has become so operative in recent years. It is recommended that the sale and distribution of "preventives" be strictly prohibited, that the "Poisons Act" be amended, that midwives be held more strictly to account, and that the Church declare itself unequivocally against restriction.

In the report on infant mortality it is shown that the mortality of infants is unnecessarily high, and the reasons for this are set forth in detail. An important point brought out in the evidence is the good effect which "mothering" has upon the health of the infant, even when not breast-fed. Maternal fondling and caressing stimulates the infant, and materially increases its chances of life.

A careful study of this excellent report in its entirety will well repay those who are interested in the important subjects with which it deals.

F. S. Crum.

STATISTICS OF THE DEAF AND DUMB IN GERMANY.

The Imperial Board of Health has recently published in separate form the statistics of the deaf and dumb resulting from the census of 1900 ("Sonderabdruck aus Medizinal-Statistische Mitteilungen"). As previous enumerations did not cover all the states, we are now for the first time in possession of complete and detailed information in regard to the distribution of the deaf and dumb throughout the entire empire.

The whole number of deaf and dumb enumerated was 48,750, distributed as follows:—

Prussia	31,448	or 64.5 per cent.
Bavaria	5,494	" 11.3 "
Saxony	2,396	" 4.9 "
Württemberg	2,213	" 4.5 "
Baden	2,147	" 4.4 "
Alsace-Lorraine	1,336	" 2.7 "
Hessen	904	" 1.9 "

In each of the other states less than 500 were found, and in nine states less than 100.

The proportion of deaf and dumb to each 10,000 of population was:—

Baden	11.5
Württemberg	10.2
Sachsen-Meiningen	9.3
Prussia	9.1
Bavaria	8.9

In the other states, as well as in Alsace-Lorraine, the proportion was less than the average for the empire, which is placed at 8.6. A more accurate picture of the geographical distribution of the deaf and dumb is obtained by a tabulation according to place of birth, as place of residence at the time of the enumeration may in some cases have been a matter of accident.

Arranged according to place of birth, the proportion of deaf and dumb to each 10,000 of population shows the following variations:—

Baden	11.5
Sachsen-Meiningen	9.9
Württemberg	9.5
Waldeck	9.3
Schwarzburg-Rudolstadt	9.2
Prussia	9.0
Bavaria	8.8

All the other states had a smaller proportion of deaf and dumb than the average for the empire. This is especially true of Saxony, Sachsen-Altenburg, Anhalt, Oldenburg, and the free cities.

The deaf and dumb were most numerous in the far eastern provinces of Prussia, which belong to the lowlands of North Germany. "This fact is in contradiction to the views of various experts, which in earlier times were commonly accepted,—namely, that deaf-muteism is more prevalent in mountain districts, particularly in the Alpine region, than in the lowlands.

"It cannot be accepted as conclusively proved that altitude or conditions relating in any way to the soil—for instance, the drinking water—have any perceptible influence upon the origin and spread of the defect under consideration. On the other hand, it seems more reasonable to attribute the numerical strength of the deaf and dumb in the north-east and in some mountainous districts to unfavorable social conditions, to which perhaps belongs the relative lack of medical assistance."

Since the census of 1871 there has been a perceptible diminution in the number of deaf and dumb. Among the 22 states for which a comparison can be made with earlier enumerations, only 4 show an increase; while in the remaining 18 the proportion of deaf and dumb is smaller than before.

Another interesting conclusion which the tables place beyond dispute is that the thickly populated communities have relatively a smaller proportion of deaf and dumb than the sparsely inhabited parts, although exceptions are not lacking. "In general, it seems to be the rule that the numerical strength of the deaf and dumb is in inverse ratio to the density of population." Again, the less favorable environment, and particularly the unhygienic conditions under which the scattered population of the lowlands live, as compared with that of the cities and the richer rural districts, seem to offer the only explanation of this phenomenon.

Of the whole number of deaf and dumb, 54.1 per cent. were males and 45.9 per cent. females, or to each 10,000 of population 9.5 males and 7.8 females. So far no satisfactory explanation has been found of this preponderance of male deaf and dumb. It is by no means a new discovery, but is the more noteworthy because of the decided preponderance of females in the total population. What is true of the empire in this respect is true of nearly all the states, with unimportant exceptions.

In respect to age it is remarked that the smallest representation is found in the group "under five years of age," which, in view of

the established fact that the defect under consideration, if not congenital, occurs in most cases before the child has reached the age of two, can only be explained by assuming that many children are not clearly recognized as being deaf and dumb until they are sent to school.

Special efforts were made in the schedules to distinguish between persons who have been deaf and dumb since earliest childhood and those who have become such later in life. For the whole empire it is found that in each 100 cases 82.7 belong in the former group and 17.3 in the latter.

The statistics at hand do not permit an exact statement in regard to the number of congenital cases as distinguished from those who have become deaf-mutes at a later period in life. It is estimated, however, that the former constitute 75.8 per cent. and the latter 24.2 per cent. of all cases. At any rate, it seems clearly established, much expert opinion to the contrary notwithstanding, that in the great majority of instances deaf-muteism is a congenital defect.

The Jews contribute relatively larger quota to the deaf and dumb class of population than the adherents of other confessions. Among the evangelical Christians there were 8.3 deaf-mutes in each 10,000 of population, among the Catholics 9.2, but among the Jews 13.6.

The preponderance of deaf-muteism in the Jewish population has been noticed in other enumerations, and has been thought largely due to marriage between blood relations. The correctness of this view is supported by the fact that congenital deaf-muteism is relatively more frequent among the Jews than among people of the Christian confessions. According to the census of 1900 the proportion of deaf-mutes who had been such from birth or since earliest childhood was, among evangelical Christians, 77.5 in each 100; among Catholic Christians, 77.0 in each 100; and among Jews, 79.2 in each 100.

About 90 per cent. of the families entering into the enumeration had but one deaf and dumb member, 7.7 per cent. had two such members, 1.4 per cent. three, etc. It is remarked that the districts containing an unusual percentage of families having more than one deaf-mute also had a proportionately large number of deaf-mutes who are or have been married. There lies in this fact a hint of the possibility that deaf-muteism may often be an inherited defect. Yet comparatively few of the deaf and dumb contract marriage. No less than 85.7 per cent. of the persons enumerated (exclusive of children under fifteen years) were returned as single. At the same time it is found that in some states marriages of deaf-mutes occur with greater frequency than formerly.

Perhaps the most important facts which appear to be established by the German census are: 1. That during the last decade there has been a perceptible decrease in the number of the deaf and dumb; 2. That the principal etiological factor in deaf-muteism, aside from hereditary tendencies, must be sought in unfavorable material conditions and an unhygienic mode of life. If the latter be true, it follows that deaf-muteism is a defect which, if it cannot be wholly eradicated, belongs, nevertheless, to the afflictions which in a measure can be prevented.

Aside from its value as a contribution to the knowledge of conditions which affect a considerable proportion of the population, this German study may well serve as a model for investigators in other countries. Among other things, it illustrates the unreasonableness of entering upon an enumeration of the deaf and dumb under restrictions like those governing our own Bureau of the Census, which expressly forbid making further inquiries than relate to name, sex, age, and post-office address. If it had been undertaken under similar restrictions, the work of the German authorities would hardly have been worthy of a review. JOHN KOREN.

RECENT SANITARY REPORTS.

The world moves, and year by year there are more municipal reports which show evidence of sound sanitary practice and good bookkeeping in the shape of vital statistics.

The *Annual Report of the Commissioner of Health of Milwaukee* for the year ending April 14, 1904, is an example of one well above the average.

The general death-rate shows a decrease from about 20 in the early seventies to under 14 since 1897. The population from year to year appears to have been calculated on a curious basis, showing wide fluctuations from year to year. The rate of increase from 1897 to 1902 is estimated at 5,000 persons per year. In 1903, however, the registrar has assumed a leap from 300,000 to 315,000, which helps to mask an increase of 200 deaths. The ratio of deaths under five to total deaths shows a significant fall from 49 and 51 in 1892–94 to 34 and 35 in 1901–03. According to Dr. Schulz, the health commissioner, the marked improvement shown is due to a special campaign conducted for the improvement of the milk supply. Diphtheria statistics show a fatality rate of over 30 per cent. for 1892–95, and

rates never rising over 21.5 per cent. since 1895 (when antitoxin was introduced). In the body of the report are given numerous tables and diagrams. One set of tables which classifies the deaths from certain selected causes and groups of causes by age, sex, social condition, and nativity in each separate month is of great practical value.

The *Annual Report of the Health Department of the City of Louisville, Ky.*, for the year ending Aug. 31, 1904, is a less up-to-date document, but furnishes some interesting contrasts with the report for the northern city. In Louisville the general death-rate has fallen from 21–24 in the early seventies to 16 and 17 since 1900. By races the rates in 1903 were for whites and blacks, respectively, 15.2 and 27.4. Much space is taken up in this report with tables of zymotic cases and deaths by districts and months which in most cases are of little value, and might well be replaced by such statistics of causes and age and race as are given in the Milwaukee report, or by occupation statistics. The difficulty of securing reports of certain diseases is indicated by the following figures:—

	Reported Cases.	*Deaths.*
Scarlet Fever	222	9
Diphtheria	492	48
Typhoid Fever	191	112
Tuberculosis	116	568

The ratio of deaths under five to total deaths has varied between 18 and 30 per cent. since 1892. If these low figures are accurate, they suggest the desirability of studying the infantile death-rate of Southern cities by races and months in order to see what factors tend to decrease diarrhœal disease. Consumption is high, causing 14 per cent. of the total deaths in 1903–04 against 9 in Milwaukee in 1903. The colored population, of course, swells this ratio, and probably decreases the infantile death-rate. Typhoid fever, also, is terribly prevalent, causing 2–4 per cent. of the total deaths, and a death-rate of 4 to 6 per 10,000 population.

The registrar of vital statistics in these and other cities would still do well to study Dr. C. V. Chapin's Providence reports, of which the *Twenty-first Annual Report of the Superintendent of Health* and the *Forty-ninth Annual Report upon the Births, Marriages, and Deaths* for 1903 are just at hand. The most striking statistical features of the first of these reports are the admirable diagrams of seasonal prevalence (typhoid fever) and yearly prevalence during the last fifty years. The figures by decades, for certain diseases which have

yielded most markedly to sanitary science, may be tabulated as follows:—

DEATH-RATES PER 100,000 LIVING.

PROVIDENCE, R.I.

	1855-65.	*1866-75.*	*1876-85.*	*1886-95.*	*1896-1903.*
Phthisis	378	306	300	256	213
Typhoid Fever	69	67	57	42	22
Scarlet Fever	120	102	71	42	8

The registration report proper is, as usual, noteworthy for its thorough analysis of all statistics by age and race, as well as season. Table VIII., for example, shows the deaths from various causes (Bertillon system), by sex, age periods, and parentage with the ratio of the deaths from each cause to all known causes and the ratio to the living population, American and foreign. Any statistician will realize the amount of labor behind the last figures, and all sanitarians will appreciate their value. Thus we see at once that the ratio of pulmonary tuberculosis to total deaths is 9.65, a little higher than the ratio in Milwaukee, much lower than that in Louisville. Measles affects the foreign-born most, whooping-cough the natives. Tuberculosis of the lungs is most fatal among foreigners (231 deaths per 100,000 population against 151 for the natives). General tuberculosis is more abundant among Americans, and a glance at the first columns of the table shows that this is due to deaths under one year. Bronchitis and pneumonia specially affect foreigners. Marriage and birth statistics are equally exhaustive. The average age of males at marriage is twenty-eight years, of females nearly twenty-five. The number of children to a mother has fallen since 1895 from 3.09 to 2.86 for Americans, while for foreigners it remains over 3.70. The percentage of children born of American parents has fallen from 42 in 1887 to 29 in 1903, while children of Irish parents have decreased from 42 per cent. to 10 per cent., and Italian births have risen since 1887 to 18 per cent. These are random facts, but they suggest the value of this report to the sociologist and statesman as well as to the sanitarian.

Dr. Arthur Newsholme contributes a brief study on *The Possible Association of the Consumption of Alcohol with Excessive Mortality from Cancer* to the *Journal of the Institute of Actuaries* for April, 1904. From a study of the records of 85,000 persons insured in the United Kingdom Temperance and General Provident Institution during a three years' period it appears that among abstainers (45,011 in number) the death-rate, not only from cancer, but from all causes, was much

lower than among the 40,324 non-abstainers. The death-rate among non-abstainers being taken in each case as 100, the rate among abstainers was 72.8 from all causes and 70.9 from cancer alone.

The fourth part of Volume XIII. of *Beiträge zur Statistik Mecklenburgs* contains the results of the census of 1900 in the Grand Duchy of Mecklenburg-Schwerin. The population increased by .34 per cent. during the five years 1895–1900 against .65 per cent. in the preceding decennium, the lessened increase being explained by an emigration of 23,267 persons, which almost balanced a natural increase of 33,601 in the population from 1895 to 1900. This emigration, mostly of males, has resulted in an increase of the proportion of women to men from 101.2 to 102.4. The greater viability of females is very strikingly shown in the following table:—

FEMALES TO 100 MALES.

0–10 years	97.2	50–60 years	108.2
10–20 years	96.6	60–70 years	111.7
20–30 years	108.1	70–80 years	120.3
30–40 years	100.8	80–90 years	132.3
40–50 years	103.4	Over 90 years	177.1

88.5 per cent. of the population of the duchy is of native birth, 10.9 per cent. of German birth from outside its borders, and only .6 per cent. of foreign birth. 98 per cent. of the inhabitants belong to evangelical Christian bodies, and for less than 1 per cent. is no religion recorded.

The comparison of such a compact population with the motley complexion of a city like Providence, R.I., makes the difficulty of the American problem of government stand out with clearness.

The *Report of the Medical Officer of Health for the Colony on the Public Health* of the Cape of Good Hope for the year 1903 contains striking figures on racial susceptibility, although the general facts are well known. Leprosy, which prevails mainly in certain contiguous districts of the colony, occurs in one group of such districts to an extent of 4.04 cases per 1,000 among the colored population, while the figure for the whites is .78. Tuberculosis shows a similar disproportion, with a sinister increase during recent years, as follows:—

DEATHS FROM TUBERCULOSIS PER 1,000 POPULATION.

	1896.	*1897.*	*1898.*	*1899.*	*1900.*	*1901.*	*1902.*
White	1.98	1.89	1.99	2.15	2.39	2.35	1.70
Colored	5.58	5.73	6.67	7.63	7.75	6.84	7.59

It is stated that abdominal tuberculosis is rare,—a fact correlated

with the rarity of bovine tuberculosis; but the unsanitary dwellings and difficulty of educating the natives to care for sputum makes the problem of pulmonary tuberculosis a most serious one.

C.-E. A. WINSLOW.

STATISTICS OF TUBERCULOSIS.

A Handbook on the Prevention of Tuberculosis. Published by the Charity Organization Society. New York, 1903.

In this volume of about 400 pages is contained a review of the first year of work of the committee appointed by the Charity Organization Society of New York City to collect and diffuse information on the prevention of tuberculosis. The bulk of the volume consists of special reports on various topics relating to the problem considered. Nearly 100 pages are devoted to a statement of "The Social Aspects of Tuberculosis, based on a Study of Statistics," by Miss Lilian Brandt, statistician of the committee.

It is the purpose of the committee to make an exhaustive investigation into some of the social aspects of tuberculosis,—how it spreads, what classes of the population it most affects, what means can most effectively be employed to prevent its spread, and, in general, to conduct a campaign of education of both the victims of the disease and the public.

Miss Brandt presents an outline of the social aspects of tuberculosis. Her discussion is based upon a study of the statistics of the Twelfth United States Census and the records of the Health Department of New York City. It is pointed out that, to get an adequate or true idea of the social and economic effects of tuberculosis, the crude death-rate requires to be carefully analyzed. Sex, age, conjugal condition, race, nativity, occupation, locality, habits, social customs, etc., all need to be carefully considered in any attempt to measure the mortality from consumption and to locate the points of the social body which it most strongly attacks. While this report contains little that is new, it is an admirable and concise summary of facts, with just enough of statistical material to illustrate the text.

The report on "The Plague in its Stronghold," by Ernest Poole, is important as illustrating some of the social aspects of the disease in New York City. Mr. Poole deals particularly with the "Lung Block," bounded by Cherry, Catharine, Hamilton, and Market Streets, pointing out specific instances of the evil social effects of a congested, dissolute, and infected tenement population.

Other topics considered by experts are "Tuberculosis: Its Causa-

tion and Prevention," by Dr. Biggs; "The Duties of the Individual and the Government in the Combat of Tuberculosis," by Dr. Knopf; and "Municipal Sanatorium for Incipient Cases of Tuberculosis," by Homer Folks.

This handbook, bristling with facts arranged in convenient form for reference, should prove an effective aid to individuals seeking a better working knowledge of tuberculosis, and especially to organizations seeking to adopt better rules intended to check the spread of the disease. On the one hand, it shows the evil effects of tuberculosis, social and economic, and, on the other hand, what its enemies may reasonably hope to accomplish by intelligent use of the known methods of prevention.

Report of the Tuberculosis Commission of the State of Maryland, 1902–04. Baltimore, 1904.

More recent than the handbook of the New York Committee on the Prevention of Tuberculosis, this report contains some valuable facts of a similar kind, and incidentally gives further proof of the increasing and wide-spread interest in the subject of tuberculosis and its prevention.

This volume contains a brief outline of the most modern conclusions as to the nature of tuberculosis, how the tubercle bacilli enter the human system, methods of prevention, and remedial measures to be adopted by victims in the incipient stages of the disease. Dr. Marshall Langton Price, medical officer of health, Baltimore, contributes a report on "The Prevalence and Distribution of Tuberculosis in the State of Maryland"; and there is also an extended report of the Tuberculosis Exposition held in Baltimore during the week of Jan. 15, 1904.

At the Baltimore Exposition an effort was made through chart exhibits, models, etc., and by means of demonstrations and addresses by qualified experts, to educate the people of Maryland in the simple and practical means of restriction and control of tuberculosis, and to instruct those afflicted how to conduct themselves so as to be least likely to infect others, and most likely to prolong their own lives. The address by Frederick L. Hoffman, statistician of the Prudential Life Insurance Company, on "The Statistical Laws of Tuberculosis," together with many of the statistical data upon which his conclusions were based, are printed as a part of this report. Particular attention is called to the table giving the mortality from consumption in cities of the United States by single years, five-year and ten-year periods, 1871–1900. Distinction is made of Northern and Southern cities, and

the rates for the latter are separately calculated for the white and negro populations. It is shown by this table that the decrease in the mortality from consumption in the United States dates back to the '70's at least, that the mortality from this cause among the negroes is still more than twice as high as among the white population of the same cities, and that, although the mortality from consumption among the negroes is declining, the decline no more than keeps pace with that of the white population. F. S. CRUM.

THE NEGROES OF COLUMBIA, MO.

The Negroes of Columbia, Mo. A Concrete Study of the Race Problem. By William Wilson Elwang, M.A. Published by the Department of Sociology, University of Missouri. Price 50 cents.

This is a master's dissertation prepared in the University of Missouri under the supervision of the Professor of Sociology in that institution, Dr. Charles A. Ellwood, who writes the preface. The material on which it is based was obtained by a house-to-house canvass of the 1,916 negroes in the university town, conducted by the class in sociology. The statistical value of results based upon so small numbers is necessarily slight, and the monograph is therefore of statistical importance mainly as furnishing an excellent example of a careful and impartial investigation of a small group of negroes.

The noteworthy conclusions reached are that the assessed property of these negroes was about $41 per capita; that the average weekly wage of negro men was $5.69, of negro women $3.75, or the average income per capita of all ages $2.10; that the negroes of Columbia, constituting about one-third of the population of the place, hold about one-twenty-fifth of its property; that the church property they hold is equal in value to nearly one-third of all their other property; that only 34 negro children were born in Columbia during the year 1901, giving a birth-rate of about 17 per thousand, or not much more than half the average birth-rate in the United States; and that the negro death-rate in that year was 24 per thousand, so that, in case these figures were typical and there were no negro immigration into the place, the negro population of Columbia would decrease.

The most important indication furnished by the thesis is upon the mooted point of race intermixture. This is a fundamental question for the future of the race in this country, and one upon which the statistical evidence is most imperfect and untrustworthy. Accordingly, the slightest ray of light in this field is welcome. Mr.

Elwang says: "Race amalgamation is going on in Columbia steadily, increasingly. The distinct negro type . . . is gradually disappearing, and the mulatto and quadroon types are steadily becoming more evident. . . . The conditions of the situation . . . admit of only one result,—the gradual disappearance of the negro *as a negro*. That is precisely what is taking place in Columbia." But nothing in the pamphlet indicates that the observations cover a long period. If not, these statements must be deemed merely a generalization from the opinions of those interviewed. The only other sources of information on this point with which I am acquainted are the opinions of competent and experienced observers elsewhere. The general testimony of such men, so far as I have obtained it in conversation, does not agree with the conclusions of the author. Whether their evidence has been affected by their desire to believe what they assert one cannot say; but it is unfortunate that in this matter, which comes very near to being the central problem in the relations of the races, we have no other evidence than that of individual and contradictory opinions.

Local studies of this sort are greatly needed, and both Mr. Elwang and Professor Ellwood are to be congratulated on the thoroughness and impartiality with which the work has been done. The general results of statistical investigation in this field for the whole country, as presented by the Census Office, need to be treated as the background for a large number of similar local studies, in which the general and abstract facts for the whole country may find their proper setting and explanation.

W. F. Willcox.

THE AUSTRIAN INDUSTRIAL CENSUS, 1902.

The most reliable information as to the economic condition of a country can be secured through industrial censuses. In Austria statistical investigations of that kind were not undertaken until 1902, when an industrial census was ordered by act of parliament. The results of the census relating to manufactures, trade, and commerce have just been published (*Statist. Monatsschrift*, vols. viii. and ix.), and disclose interesting facts. The publication of the statistics of agriculture has been somewhat delayed.

Two different schedules were used. The Central Commission of Statistics in Vienna, having charge of the investigation, proposed a separate enumeration of the home workshops on a special schedule (*Heimarbeiter-Karte*). Finally, however, that intention was abandoned, and the "home workers' cards" used mainly in the case

of certain small shops, the owners of which had no legal permit to engage in manufacturing.

The definition of the establishment, as the unit of enumeration, is somewhat different from that given in the United States Census Reports of 1900. In Austria the industrial or commercial concerns which comprise more than one undertaking were counted as separate establishments, even if located in the same city.

Statistics of wages, cost of materials used, and the value of goods made were not collected. Any attempt to ascertain these facts would in this country result in a failure.

The number of establishments and of persons employed in all branches of manufactures, trade, and commerce, was on June 3, 1902, as shown in the following table. Railways, banking, as well as the establishments of co-operative societies, are not included in this statement.

	Establishments enumerated on the General Schedule.		Establishments enumerated on the Home-workers' Cards.	
	Number of Establishments.	Persons employed.	Number of Establishments.	Number of persons employed.
Manufactures	627,360	2,824,519	356,995	463,536
Trade and commerce . . .	360,917	693,248	—	—
Total	988,277	3,517,767	356,995	463,536

In all establishments 3,981,303 persons were engaged in gainful occupations. This number includes salaried officials, and wage-workers, as well as employers.

The number of persons in each of these "social classes" is shown for all establishments enumerated on the general schedule in the table below:—

	Employers.		Salaried Officials.		Wage-earners.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Manufactures	567,559	21.1	86,259	3.1	2,170,701	76.8
Trade and commerce . .	325,540	47.0	232,551	33.5	135,157	19.5
Total	893,099	25.4	318,810	9.1	2,305,858	65.5

Nearly the whole number of persons employed in the establishments enumerated on the home-workers' card were owners and members of their families.

The following summary shows the industrial population of Austria distributed by sex:—

	Males.		Females.	
	Number.	Per Cent.	Number.	Per Cent.
Manufactures (general schedule)	2,187,837	77.4	636,682	22.0
Manufactures (special schedule)	262,319	56.6	201,217	43.4
Trade and commerce	471,411	68.0	221,837	32.0

The employment of women predominates in the small shops enumerated on the home-workers' cards. Trade and commerce come next in this regard.

The proportion of females employed in Austrian industries appears generally larger than in those of the United States.

The Austrian industrial census shows also the size of the establishments according to the number of persons employed. The results of the investigation were as follows:—

	Manufacturing Industries.*		Trade and Commerce.	
	Number of Establishments.	Per Cent.	Number of Establishments.	Per Cent.
1 person	238,970	39.1	204,168	58.0
2 to 5 persons	317,001	51.9	138,600	39.2
6 to 10 persons	29,916	4.9	6,949	1.9
11 to 20 persons	11,553	1.9	2,237	0.6
21 to 100 persons	10,317	1.7	1,082	0.3
101 to 300 persons	2,250	1.4	79	*a*
Over 300 persons	831	0.1	17	*a*

The vast majority of establishments are small shops. As no data relative to the value of products are available, it is difficult to judge the relative economic importance of each group of establishments.

The large fraction of establishments of the smallest size employed only 11 per cent. of the industrial population enumerated by the census.

* Establishments enumerated on the general schedule only.

a Less than one-tenth of 1 per cent.

The following table divides the industries and trades in Austria in accordance with the form of organization:—

Form of Organization.	Establishments.*		Persons Employed.	
	Number.	Per Cent.	Number.	Per Cent.
Individual ownership	959,072	97.0	2,570,073	73.1
Partnership	20,280	2.1	513,334	14.6
Joint stock company	2,765	0.3	291,177	8.2
Miscellaneous	6,140	0.6	143,183	4.1

It appears that the primitive form of industrial organization still predominates in Austria. Of the four forms of organization, individual ownership is relatively most important; but the average number of persons employed in *one* establishment of this class is 2.7 only against 25.3, 105.3, and 23.3 persons, respectively, in the other classes.

The census reports that 56,762 establishments used power the amount of which aggregated to 1,646,092 horse power. In 8,297 establishments power was used, but the amount could not be ascertained.

The following figures indicate the economic importance of the different kinds of power used:—

Establishments using	Number of Establishments using Power.	Number of Establishments reporting Amount of Horse Power.	Horse Power.
Steam	11,502	10,928	957,980
Gas	1,894	1,864	15,090
Water wheels	38,088	31,259	432,632
Electric motors	3,447	3,228	227,268
Other power	1,831	1,186	13,132
Total	56,762	48,465	1,646,092

Only those establishments enumerated on the general schedule have been regarded in the above statement.

At present there exists no statistical material to show the development of Austrian industries. This can be rendered possible in taking periodically industrial censuses, as has been done in the United States since the earlier part of the nineteenth century.

H. FEHLINGER.

* Enumerated on the general schedule.

TENEMENT HOUSE REPORT.

First Report of the Tenement House Department of the City of New York. January 1, 1902–July 1, 1903. By Robert W. de Forest, Tenement House Commissioner. 2 vols. vi, 426; 480 pp.; 221 illustrations, maps, and photographs. 1904.

A word regarding the circumstances leading up to the publication of this report is first in order. In 1900 the New York State Tenement House Commission, appointed by Governor Roosevelt earlier in that year, made its report, which was adopted in its entirety by the legislature and approved by the governor on April 12, 1901. Its proposed separate Tenement House Department for the City of New York was made a part of the new city charter which went into effect on Jan. 1, 1902. Mayor Low, who was the first mayor under the new charter, appointed Mr. Robert W. de Forest, formerly chairman of the State Commission, as Tenement House Commissioner; and he in turn named Mr. Lawrence Veiller, the former secretary of the State Commission, as his first deputy in the new department. As no official State report had been issued, these two gentlemen published an unofficial report in two volumes, entitled, "The Tenement House Problem," which was, in effect, a comprehensive statement of the results of their investigations made while members of the State Commission. This publication included also the Tenement House Law as amended and an introduction bringing down the history of Tenement Reform in New York to 1903, and it served to prepare the way for the very practical and largely experimental work which the new city department was to undertake.

The first report of this new department, which is under immediate consideration, describes in minute detail the work of the department during the first eighteen months of its existence, Jan. 1, 1902, to July 1, 1903, and is profusely illustrated by a series of photographs, taken for purposes of record, and a number of specimen schedules, used in prosecution of the work. As a working manual for the use of tenement-house officials and the interested public, this practical guide serves a valuable purpose; for it presents clearly the whole situation and the methods of work adopted.

Of particular interest is the description, in the first volume, of the organization of this department and of the means by which it was made one of the most important branches of the city government. The great importance of the department lies in the fact that here is centred the entire responsibility for the care of all of the tenement

houses in the city, whereas formerly that responsibility had been divided between four different departments,—the Health, Building, Fire, and Police Departments. Thus the creation of this new department was a unique municipal experiment, there being no similar department in any other American city. The department as a whole is under the direct charge of the Commissioner, and has jurisdiction over the whole city, while, for convenience, it was organized with two divisions, the one covering Manhattan and the Bronx, and the other covering Brooklyn, Queens, and Richmond, these two divisions being respectively under the charge of the first and second deputy commissioners. Each division consists of four chief bureaus: the Executive Bureau, the Bureau of Records, the New Building Bureau, and the Old Building Bureau. A general Bureau of Records, under the direction of a registrar, provides for the systematic filing of records. By its various devices for recording facts collected and for keeping a constant check on the work of the inspectors and other subordinates it proves a valuable adjunct to the department. Other subjects treated in the first volume and which deserve special attention are: the method of handling citizens' complaints, regulations for periodic inspections, co-operation with other departments, appointment of women inspectors, and the description of the functions of the various bureaus specified above.

The second volume of this report is largely devoted to the presentation of statistical material. The results of two investigations, which were decided departures from the ordinary routine inspection work, are here given in a series of tables and maps. They are of distinct value, embodying as they do detailed information covering a large territory, and arranged for definite official use.

The first of these investigations is a study of the rentals of tenements in different districts of the city and of vacant apartments found in them. During the period from Nov. 11, 1902, to Dec. 31, 1902, tenement houses to the number of 71,618 were inspected in this regard by a force averaging 57 employees. The information obtained was tabulated and arranged by wards, and shows the number of apartments in each ward renting for a specified rental, and also the number of tenement houses in each ward in which the average rental per room was a stated sum per month. Concerning vacant apartments there is recorded not only the number of vacant apartments found in each ward, but also the number of houses in each ward which contained any vacant apartments.

The second of these investigations is a block census of the tenement population of Manhattan. This census is, perhaps, the most

significant feature of the whole work; for it supplies that accurate information, the lack of which has always seriously hampered the student in his endeavor to arrive at definite conclusions regarding the identity of the tenement population. An independent investigation of this nature would have involved too great an expense to the department, but as the desired facts regarding the number of families, nativity, and other data for each house in the city, had already been collected by the United States Census in 1900, the department obtained, for the sum of $10,000, practically all of the desired material, copied in card form from the original census schedules. This information was received in January, 1902, and such part of it as applied to tenement houses in the borough of Manhattan was tabulated first by wards and then by blocks. The results of this investigation are presented both in tabular form and also by a series of ward maps covering twenty-two distinctively tenement-house wards, and showing the essential facts regarding each block in each ward by means of a color scheme. The ward tables show by blocks: (1) the nativity and parentage of heads of families; (2) the number of families having a given number of persons; and (3) the number of persons residing in families of a given number of persons; together with summary tables for (1), (2), and (3) by wards only for the tenement, non-tenement, and total population. By the use of this material, presented both graphically and in tabular form, the degree of congestion in the various centres and other facts, valuable alike to the student of social conditions and to the city authorities, can be readily ascertained.

Further space in the second volume is devoted to twelve appendices, among which should be noted the very explicit tabular statements regarding the actual work done by the several divisions of the department. These statements, covering such work as that of inspection, vacating and demolishing houses, location and numeration of dark rooms, etc., by their very completeness point to the efficiency of the Bureau of Records, and its admirable method of cataloguing and indexing the material secured. There are also appended to this volume lists of the New Law tenements, a statement of the provisions of the Greater New York charter relating to this department, besides general forms of orders issued, and the more important plan forms used by the department.

As a result of the recent changes in the political administration in New York City, the men who were the leaders in the establishment of this new Tenement House Department are no longer officially connected with the work of reform, begun by them with so great enthu-

siasm and energy. But their pioneer work in developing this new line of municipal activity, so vividly described in the first report of the department, remains as a valuable heritage, not only to the city which they sought to serve, but to the world at large.

ROSWELL F. PHELPS.

GERMAN TRADE STATISTICS.

Die deutsche Handelsstatistik in ihren gegenwärtigen Stand und die Vorschläge zu ihren Verbesserung. By Dr. Hans Grimm. In *Allgemeines Statistisches Archiv.* Vol. VI., Part 2, pp. 35–62.

The basis of the present system of German Trade Statistics is the Imperial law of July 20, 1879, governing statistics of trade between the German customs districts and foreign countries. The customs territory and the German Empire are not coextensive, since various free ports—including Hamburg, Bremen, Cuxhaven, Emden, and others—are excluded, while the Grand Duchy of Luxemburg and two of the Austrian municipalities (Jungholz and Mettleburg) are included. The omission of the statistics of trade from the free ports has long been recognized as a serious defect.

The statistical work naturally divides itself into two parts: first, the collection of the raw material; and, second, the elaboration and presentation of the statistics. The collection of the raw materials, which is governed by the law of 1879, and amendments of Oct. 29, 1896, is described by Dr. Grimm in detail. Briefly stated, the system is based upon the declarations made by shippers or importers of all goods entering. The offices at which the declarations are made are of two kinds, customs bureaus (*Anmeldeämter*) and customs posts (*Anmeldeposten*). In the former the administration of the federal customs is also performed. In the latter (*Anmeldeposten*), situated on the boundary, is undertaken only the collection of statistics.

The present system is inadequate in many ways. The statistics are not clear, since in some cases the German exporter must make a customs declaration with full details of the goods and their value, while in other cases merely a few details are required, with no value. The present system is also burdensome in its requirements upon the shipping trade. In the case of imports, however, there is less complexity, as the statistical information is derived from the records of the customs, and is detailed.

The reports of traffic, gathered by the different bureaus, numbering about 2,200, are sent twice a month to the Imperial Statistical

Bureau in Berlin. There they are compiled, and appear in the two publications of that bureau as:—

1. The monthly report upon the foreign trade of the German Customs Districts, giving details in regard to class, quantity, origin, and destination of goods, but no valuations.

2. The yearly report of the foreign trade, giving, in addition to the former details, the value of the different goods.

The very important statistics in regard to value are not obtained from the returns of the customs declarations, except in a few cases, but instead are derived through the work of the Imperial Statistical Bureau. The system is one of valuation or appraisal. The basis of this is a yearly inquiry made by a special commission into the current prices of goods in all forms of trade. A description of the system is to be found in the publication of the Imperial Statistical Bureau, entitled "Die Deutsche Handelsstatistik nach ihren gegenwärtigen Einrichtungen und Leistungen." Its method may briefly be described as grouping related goods in a few principal classifications and finding the prevailing prices for these.

Several changes and improvements are suggested.

Special discussion is given to the question whether the valuation or appraisal method (*Schätzung*) shall continue to be employed or whether a system of compulsory declarations of value (*obligatorische Wertdeklaration*) shall be introduced. The first method, it is held, has much uncertainty. Its weak points are the difficulty of proper valuation of the goods collected into groups, containing in themselves different varieties and qualities.

At the outset it would seem that a compulsory declaration of value is the best method for securing statistics in regard to value, but a more careful study reveals grave defects. Though it is a much simpler and direct way of getting at the total value, it depends wholly on the trustworthiness of the declaration of the shipper. Methods are discussed which will lend themselves to the requirements of the shipping trade, and not embarrass it with too severe burdens and regulations; the question of the safeguarding of business secrets is considered; the complications due to the fact that the value of goods may be given, as at the factory, shipping port, or destination, are touched upon; also the efforts to secure trustworthy declarations through a system of supervision of penalties.

Under a compulsory declaration of value system, estimates are not used. Instead, accurate statistics of the total trade will be afforded, and reliable average prices can be computed. Much valuable information in regard to the movement of prices will be furnished. Further-

more, it will be possible, for the first time, to secure an accurate trade balance, showing the value of imports and exports.

On the other hand, the weakness of the compulsory declaration system, which its opponents are attacking vigorously, depends upon the accuracy of individual declarations. It is claimed that there will be great opposition to the enforcement of this system on the part of the commercial and industrial interests. There is fear that the information collected will be used for other than statistical purposes, that trade secrets will be divulged, or that the information will be used for purpose of taxation. As a result of false declarations, the whole body of statistics will be vitiated, and methods of supervision, or regulations to punish false declarations, to be effective at all, will be very burdensome to trade because of delays involved in inspection. Furthermore, there will be the difficulty in getting the information required by the shipper for the declaration, especially as to the place which serves for a basis in figuring price.

Dr. Grimm thinks that the objections have probably been overemphasized, and believes that, once the system of compulsory declarations is established, the commercial and industrial interests will adapt their methods to it, particularly since modifications would be made to suit the requirements of trade. The information is to be asked for in the form most convenient to the shipper, and the work of making the different returns comparable will fall on the Statistical Bureau.

DAVID L. WING.

WAGE STATISTICS.

A computation, based upon the wage returns shown in the Special Report of the Twelfth Census on "Employees and Wages," has been made in the Statistical Laboratory of Columbia University, under the direction of Professor H. R. Seager.

The data used were obtained from the tables showing rates per week in the "1900 Total," pp. 616–779. No system of weighting of industries was employed, but the results are simply a grand summary of the rates received by the different individuals tabulated.

From the statistics given for 156,569 men, sixteen and over, employed in 22 leading manufacturing industries, the results obtained are as follows:—

Lower quartile	$8.31 per week
Median	10.55 " "
Upper quartile	13.93 " "

For convenience in handling the figures, wage groups of one dollar were used instead of the fifty-cent interval.

The following table shows the distribution of rates per week:—

Rates	*No.*	*Rates*	*No.*	*Rates*	*No.*
Under $2	35	26–27	232	51–52	13
2– 3	672	27–28	348	52–53	11
3– 4	2,638	28–29	273	53–54	9
4– 5	4,239	29–30	160	54–55	9
5– 6	3,810	30–31	347	55–56	8
6– 7	7,851	31–32	86	56–57	8
7– 8	15,831	32–33	105	57–58	7
8– 9	13,098	33–34	84	58–59	7
9–10	21,597	34–35	103	59–60	7
10–11	15,345	35–36	146	60–61	11
11–12	7,455	36–37	128	61–62	6
12–13	14,939	37–38	115	62–63	6
13–14	10,604	38–39	113	63–64	6
14–15	6,488	39–40	117	64–65	6
15–16	9,352	40–41	50	65–66	6
16–17	5,741	41–42	39	66–67	8
17–18	2,779	42–43	39	70–71	1
18–19	4,686	43–44	30	71–72	1
19–20	1,686	44–45	30	72–73	1
20–21	1,081	45–46	26	75–76	1
21–22	1,318	46–47	16	76–77	1
22–23	798	47–48	14	84–85	1
23–24	534	48–49	14	90–91	1
24–25	704	49–50	14		
25–26	505	50–51	19		156,569

Wages of Females.

From the weekly rates of 16,724 women, sixteen and over, in 13 industries, the following results are obtained:—

Lower quartile	$4.49 per week
Median	5.64 per week
Upper quartile	6.86 per week

D. L. W.

BULLETINS OF THE CENSUS OFFICE.

The following memorandum presents in convenient form the bibliography of Bulletins which have been published to date by the Census Office, Washington:—

No. 1.—*Geographical Distribution of Population.* (24 pages. Edition, 15,000 copies.) Discussion of distribution of population, by

drainage basins, physiographic regions, in accordance with mean annual temperature, mean annual rainfall, latitude, and longitude.

No. 2.—*Cotton Ginning* (*Crops of* 1899 *to* 1902, *inclusive*). (45 pages. 14 maps. Edition, 48,000 copies.) Statistics for cotton crop of 1902, with comparative statistics for 1901, 1900, and 1899.

No. 3.—*Street and Electric Railways.* (193 pages. Edition 8,000 copies.) Preliminary report on equipment, cost of construction, expenses, income, wages, wage-earners, and operations for year.

No. 4.—*Discussion of Increase of Population.* (63 pages. 10 maps and diagrams. Edition 8,500 copies.) Discussion of increase of population for the United States and outlying districts, by geographic and physiographic divisions, States and Territories, counties, cities, and county districts.

No. 5.—*Central Electric Light and Power Stations.* (59 pages. Edition, 10,000 copies.) Detailed statistics of equipment, cost of construction, expenses, income, wages, and wage-earners.

No. 6.—*Mineral Industries of Porto Rico.* (18 pages. 7 maps and illustrations. Edition, 6,000 copies.) Historical, descriptive, and statistical.

No. 7.—*Estimates of Population.*—(21 pages. Edition 10,000 copies.) Method and result of estimating the population of the larger cities of the United States in 1901, 1902, 1903.

No. 8.—*Negroes in the United States.* (333 pages. 14 maps and diagrams. Edition, 8,000 copies.) Analysis of negro population and the negro as a farmer, with general tables.

No. 9.—*Mines and Quarries.* (59 pages. Edition 13,000 copies.) Preliminary report on mines and quarries, presenting statistics for all mines and quarries and petroleum and gas wells, with such manufacturing operations as were carried on in immediate connection therewith, for year ending Dec. 31, 1902. Statistics confined to operations at mine, quarry, or well.

No. 10.—*Quantity of Cotton Ginned in the United States* (*Crops of* 1899 *to* 1903, *inclusive*). (56 pages. 13 maps. Edition, 40,000 copies.) Statistics for cotton crop of 1903, with comparative statistics for 1902, 1901, 1900, and 1899. Special features,—cotton reclaimed by thrashing cotton bolls, estimate of cotton destroyed by the boll weevil, and distribution by States of the quantity of linter cotton saved by the cottonseed-oil mills from reginning seed of the crop of 1903.

No. 11.—*Municipal Electric Fire Alarm and Police Patrol Systems.* (33 pages. 2 illustrations. Edition, 7,000 copies.) Containing an historical and descriptive account of these systems with detailed statistics of construction and equipment.

No. 12.—*The Executive Civil Service of the United States.* (239 pages. Edition, 15,000 copies.) Detailed statistics of nativity, age, sex, service, salary, occupation, and location of the employees in the civil service of the United States.

No. 13.—*A Discussion of Age Statistics.* (53 pages. 2 maps and diagrams. Edition, 8,000 copies.) Analysis of age statistics in the United States, with detailed tables.

No. 14.—*Proportion of the Sexes in the United States.* (51 pages. 8 maps. Edition, 8,000 copies.) Discussion of the proportion of the sexes, with detailed tables.

No. 15.—*A Discussion of the Vital Statistics of the Twelfth Census.* (24 pages. Edition, 8,000 copies.) Supplemental and comparative statistics.

PRESERVATION OF CENSUS SCHEDULES.

In the *Guide to the Archives of the Government of the United States in Washington*, published by the Carnegie Institution of Washington (1904), the following account is given of the original census schedules on file in the Department of the Interior (pp. 142–144).

Exclusive of the unbound schedules, there are about 4,600 volumes for the first ten censuses. The following list of the schedules was furnished for this report through the courtesy of Mr. Acker, the chief of the division. It may be supplemented by the volume on "The History and Growth of the United States Census," by Carroll D. Wright and William C. Hunt (Senate Doc. 194, 56th Cong., 1st Sess.), which contains a description of these schedules (pp. 76–79) and an account of the exact character of the inquiries in each census. These original schedules contain, of course, the detailed information from which the printed summaries are compiled.

1. First Census, 1790 (27 vols.).

Population only: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, Maryland, District of Columbia, North Carolina, South Carolina.

2. Second Census, 1800 (27 vols.).

Population only. Same States as above, with addition of Delaware.

3. Third Census, 1810 (44 vols.).

Population and manufactures bound together. Same as second census, with addition of Virginia, Kentucky, and Orleans Territory.

4. Fourth Census, 1820 (96 vols.).

(*a*) Population, 73 vols.: Maine, New Hampshire, Vermont, Massa-

chusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Mississippi, Louisiana, Tennessee, Kentucky, Ohio, Illinois, Indiana.

(*b*) Manufactures, 23 vols.: same as for population, except schedules for Delaware, District of Columbia, Illinois, Indiana, Louisiana, Mississippi, Rhode Island, and South Carolina are missing.

5. Fifth Census, 1830 (190 vols.).

Population only: no schedules missing.*

6. Sixth Census, 1840 (304 vols.).

(*a*) Population, 273 vols.

(*b*) Agriculture, Manufactures, Mines and Mining, Fish and Fisheries, Commerce, and Education, 31 vols.

7. Seventh Census, 1850 (843 vols.).

(*a*) Population, free and slave inhabitants: free, 588 vols.; slave, 81 vols. (Slave schedules for Delaware and District of Columbia are missing.)

(*b*) Agriculture, 101 vols.

(*c*) Mortality, 32 vols.

(*d*) Industry, 21 vols.

(*e*) Social Statistics, 20 vols.

8. Eighth Census, 1860 (924 vols.).

(*a*) Population, free and slave inhabitants, on separate schedules: free, 711 vols.; slave, 49 vols.

(*b*) Agriculture, 106 vols.

(*c*) Mortality, 21 vols.

(*d*) Manufactures, 18 vols.

(*e*) Social Statistics, 19 vols.

9. Ninth Census, 1870 (826 vols.).

(*a*) Population, 649 vols.

(*b*) Agriculture, 114 vols.

(*c*) Industry, 31 vols.

(*d*) Mortality, 28 vols.

(*e*) Social Statistics, 4 vols.

10. Tenth Census, 1880 (1,328 vols.).

(*a*) Population, 824 vols.

(*b*) Agriculture, 322 vols.

(*c*) Manufactures, 72 vols.

(*d*) Defective, Dependent, and Delinquent Classes, 58 vols.

(*e*) Mortality, 52 vols.

11. Partial Census of 1885.

* Beginning with the fifth census, the schedules are complete.

Unbound schedules of population for Nebraska, Colorado, Florida, Dakota Territory, and New Mexico Territory.

12. Eleventh Census, 1890.

The schedules of the Eleventh Census are unbound. It is estimated that the population schedules, if bound, would make about 30,000 volumes, owing to the form of the schedules. The agricultural schedules have been transferred to the custody of the Department of Agriculture, and the schedules relating to veterans have been transferred to the Pension Bureau. The schedules relating to mortality and social statistics were damaged by fire in March, 1896, and have been destroyed by order from the Interior Department.

SAMUEL W. ABBOTT, M.D.

Dr. Samuel Warren Abbott, secretary of the Massachusetts Board of Health, died suddenly at his home in Newton, Saturday morning, October 22. He was born in Woburn, June 12, 1837. He attended the high school there, and then went to Brown University at Providence, where he graduated in 1858. He graduated from the Harvard Medical School in 1862. Soon after the outbreak of the Civil War he entered the navy as an assistant surgeon, and served until 1864. He saw some active service in the navy, notably on the Monitor "Catskill"; but his desire for still more activity led him to seek a transfer to the army. He resigned from the navy, and was appointed as surgeon to the First Massachusetts Cavalry. In connection with this regiment he was actively engaged until the end of the war. He then returned to Woburn, and practised his profession there from 1865 until 1869. From there he moved to Wakefield, where he continued to live until 1902, when he moved to Newton.

He was coroner of Middlesex County from 1872 to 1877, then was appointed medical examiner and served as such until 1884. He was appointed health officer of the combined Boards of Health, Lunacy, and Charity in 1882, and continued his faithful and acceptable services in this position until the Board of Health was restored to its previous solidarity, when he became secretary, and held this position until the time of his death, twenty-two years in all.

In his earlier years as a practitioner, Dr. Abbott took much interest in surgery, and in working out some questions which have later claimed from others more and more study. Small-pox and vaccination always interested him deeply: at one time he conducted a small vaccine farm in connection with his practice. He wrote much and serviceably on these and kindred subjects. Almost the last thing he wrote was an editorial on "Smallpox Infection from Isolation Hospitals," for the issue of this *Journal* of October 20. He was an advocate of the law for supplanting the old coroners by the present system of medical examiners, and discharged the responsible duties of a medical examiner for seven years. For five years, from 1886 to

1890, inclusive, he edited the Massachusetts Registration Reports of Births, Marriages, and Deaths, prepared under the direction of the secretary of the Commonwealth. His immediate predecessors in the preparation of these reports were Drs. Charles F. Folsom and George Derby. These reports, through all these and the still earlier years, were regarded as models in other States and in foreign countries.

Dr. Abbott contributed frequently to the Transactions of the American Public Health Association; valuable and important articles for Woods's Reference Handbook of the Medical Sciences; for Gould's Year Book; reports on progress in matters connected with hygiene and public health; and instructive editorials on kindred subjects for this *Journal.* The reports of the Massachusetts Board of Health through many years are a monument to his industry.

But, notwithstanding all these varied interests, Dr. Abbott's real passion was for statistics. He was a born statistician, minute, painstaking, accurate, tireless, and honest. It will be no easy matter to fill satisfactorily the place which he occupied in the medical community and in the service of the State. He was a member of the Massachusetts Medical Society, the American Medical Association, the American Public Health Association, the American Statistical Association, the Loyal Legion, the Royal Statistical Society of Great Britain, the Société Française d'Hygiène.

As a man, Dr. Abbott was singularly modest, simple, and retiring, and commanded the respect of all who knew him. He leaves a widow, a son, and daughters.—*Boston Medical and Surgical Journal,* Nov. 3, 1904.

In the death of Dr. S. W. Abbott, which occurred at Newton Centre on Oct. 22, 1904, the loss of one of the most active and influential American workers in vital statistics has been sustained. Dr. Abbott was secretary of the Massachusetts State Board of Health since 1886, and in that capacity had the editorial direction of the Massachusetts Registration Reports for several years. He was a councillor of the American Statistical Association, and a frequent contributor to its *Publications.* The issue for June, 1904, received since his death, contains an interesting review of Dr. Hayward's paper on "Life-tables," a subject of the first importance in vital statistics, and one in which he was greatly interested. The preceding issue had an important paper on "The Decrease of Consumption in New England," reference to which was made in a previous issue of the *Bulletin.* The masterly series of annual reports prepared by Dr. Abbott contained useful summaries, and illustrated the practical service that reliable mortality statistics sustains to progressive sanitary work.

The *Boston Medical and Surgical Journal,* to whose editorial columns Dr. Abbott was a frequent contributor, remarks: "But, notwithstanding all these varied interests, Dr. Abbott's real passion was for statistics. He was a born statistician, minute, painstaking, accurate, tireless, and honest. It will be no easy matter to fill satisfactorily the place which be occupied in the medical community and in the service of the State."

It is not only with a profound sense of regret for the cause of Amer-

ican sanitation and registration that the news of his death was received, but also with a deep feeling of personal loss and sorrow. Since 1894, when the writer first made the acquaintance of Dr. Abbott at the session of the American Public Health Association at Montreal, he has been in more or less constant correspondence with him, and never failed to find untiring interest, cordiality, and excellent advice put freely at his service. Dr. Abbott was chairman of the Committee on Vital Statistics of the Association for many years, succeeding Dr. J. S. Billings, and resigning in favor of the writer in 1897. His report to the Association in 1894 consisted of a clear presentation of the merits of the classification of causes of death reported at the meeting of the International Statistical Institute held at Chicago during 1893, and it is from this report as a basis that the movement in this country in favor of the general adoption of the uniform classification then known as the "Bertillon system" began to grow. Dr. Abbott was one of the three members of the commission appointed by the Association to aid in the work of revision of the system performed at Paris in August, 1900, since which date it is known as the International Classification, and is used by the United States Census, all registration States, and many foreign countries. His name should never be forgotten in connection with the history of the development of uniform and comparable international mortality statistics.—*Dr. Cressy L. Wilbur*, in *Michigan Monthly Bulletin of Vital Statistics.*

BUREAU OF STATISTICS OF DEPARTMENT OF AGRICULTURE.

The following extracts are taken from the report of the Secretary of Agriculture, Nov. 26, 1904, in regard to the statistical work of the department:—

On July 1, 1903, the Division of Statistics of this department, which is the oldest distinctively statistical agency of the government, antedating by a score of years the creation of this department, received the broader organization of a bureau.

As now organized, the Bureau of Statistics includes a Division of Domestic Crop Reports, a Division of Foreign Markets, and a Miscellaneous Division, which conducts special investigations and collects statistics on rural economics. The work of the Division of Domestic Crop Reports forms the most conspicuous feature of the statistical work of the department. It employs nearly two-thirds of the entire clerical force of the Bureau, and calls to its aid the public-spirited service of nearly 250,000 voluntary correspondents, whose painstaking service deserves grateful appreciation. The results of its investigations are published monthly in the *Crop Reporter*, of which over 1,300,000 copies were distributed during the year.

The general appreciation by the business and farming public of the value of the department crop reports grows steadily. Criticism is

not lacking. On the contrary, it is one of the curious features of this work that, the more closely reports represent the actual facts and the wider the appreciation of their accuracy, the more subject they become to criticism. This is undoubtedly due to the fact that, as their general accuracy is more and more widely recognized, they necessarily exercise a greater influence upon the markets, thus inevitably favoring or antagonizing, as the case may be, some of those who are engaged in the game of speculation in agricultural products.

This immediately attracts the adverse comments of the losers. This result is unavoidable, and is apparently the inevitable penalty the department must pay for issuing reports so reliable and so generally appreciated as to have instant effect on the markets. Were the reverse true, and were these reports regarded as unreliable, they would not influence prices, and criticisms would be reduced to a minimum.

The Bureau is earnestly engaged in studying the efforts of numerous associations of cotton manufacturers organized in several European countries, for the purpose of promoting the production of cotton in new lands, with a view to rendering them more or less independent of the American cotton-grower. These efforts are being especially directed to the interior of Africa. Before long it is thought that the department will be able to publish some valuable matter on this interesting subject.

The production and international movement of grain in the principal European countries is another subject which is receiving the earnest attention of the Division of Foreign Markets.

With the assistance of experts newly engaged, the rice and truck crops will for the first time be made the subjects of systematic and continuous statistical investigation. The grain belt has been redistricted, and an additional field agent assigned to it.

NOTES.

The Health of the Nation. By C. H. d'E. Leppington, in the *Charity Organization Review* (London), Vol. XV. No. 88.

This is a brief review of the Report of the Royal Commission on Physical Training in Scotland recently published. Mr. Leppington mentions the investigations of several men of note in Great Britain, but the greater part of his article consists of a résumé of some of the evidence collected by the commission. He says that the prevalent opinion is that the population of Great Britain is undergoing a process of gradual physical deterioration; and this view appears to be sustained by the evidence brought out in the investigations of the commission. The reason for this tendency seems to be the unfavorable conditions of city life among the poor, such as lack of air and light,

and the opportunities and incentives for healthful exercise. The writer's own opinion appears to be somewhat at variance with those quoted by him. At any rate he takes a more hopeful view of the situation, and thinks that much good may be accomplished by properly directed physical exercises in the schools. C. W. D.

Report on the Growth of Industry in New York. Part V., Second Annual Report of the Department of Labor of New York. Albany, 1904. pp. viii, 670.

This contains an interesting and well-arranged review of the growth of the industrial resources of New York, based upon the Census of 1900. The analysis and description of industries is prepared by Dr. A. F. Weber, chief statistician of the department. Chapter 3 contains a general historical review from colonial times, and to this is appended monographic treatment of the following industries: clothing and millinery, metals, machines, and conveyances, food, tobacco and liquors, printing and paper goods, building industry, lumber and manufactures of wood, chemicals, oils and illuminants, textiles, leather and rubber goods, stone, clay, and glass products, and fisheries.

The volume is generously supplied with geographical charts, showing the distribution of establishments in the several industries throughout the State, distinguishing between establishments containing fifty wage-earners and those employing less.

In the Appendix of the *Sixty-fifth Annual Report of the Registrar-General of England and Wales* there is published a comprehensive "Abstract of Arrangements respecting Registration of Births, Deaths, and Marriages in the British Dominion beyond the Seas." This is the first time such a compilation has been made since 1867. The abstract shows briefly: (1) the conditions under which registration is effected; (2) the periods covered by the record; (3) the fees payable for searches and certificates; and (4) the person with whom the records are deposited. The registrar-general reports that the returns "show that special flexibility of system which is no doubt one of the secrets of Britain's success in the colonial field, for, whilst all the registration systems set forth in the abstract are practically identical in principle with that of the mother country, they are frequently worked out very differently in detail."

In Tables 45–63 of the *Sixty-fifth Annual Report of the Registrar-General of England and Wales* international statistics are published

concerning the marriages, births, and deaths in the United Kingdom and in the principal States on the continent of Europe. The birth-rates in 1902 of all the countries from which returns have been received were below the average of the previous twenty-five years, except in the cases of Switzerland and Spain. In several of the countries the rates were also lower than those of the year 1901. In Hungary the birth-rate, which had fallen from 39.3 in 1899 to 37.8 in 1901, rose again in the year 1902 to 38.8. The death-rates were in all cases below the average, and in most cases were also below those of 1901. The countries showing a higher death-rate in 1902 than that in 1901 were Austria, Hungary, Belgium, Italy, and Roumania.

Emigration to the United States. Special Consular Reports, Vol. XXX. Issued by the Bureau of Statistics, Department of Commerce and Labor. Washington, 1904. pp. xx, 210.

This volume contains the replies to a circular letter of inquiry sent to the consuls of the United States government in different parts of the world for the purpose of determining the present character of immigration. A similar inquiry was made and published in 1890.

The points on which special information was sought are briefly as follows: (1) Statistics as to the increase or decrease of emigration and the proportion which the United States receives; (2) the sections and occupations from which emigrants come; (3) the moral and intellectual status of those going to the United States; (4) the family relationship; (5) capacity as wage-earners; (6) physical status; (7) causes of emigration; (8) attitude of the government; (9) nature of the examinations made by consuls; (10) intention of the emigrants to return; (11) attitude of public sentiment; (12) assistance of government; (13) aid given to emigrants from friends in the United States; (14) opinion as to the amount of emigration in the future.

Much of the material in this volume is fresh, and contributes to a far better understanding of the many elements concerned in the problem.

An interesting contribution to the literature of the tenement house and the conditions under which an English urban population lives is found in "The History of Cambridge," by Henry Cayley, published in the *Economic Review* of Oct. 15, 1904 (p. 413). The inquiry made by a local committee extended to 2,226 houses, with 10,047 rooms, containing a population of 8,974. Nearly one-half of the persons with whom the reports deal live under conditions of crowding. Statistics are given showing the structural condition of houses, water

supply, sanitary accommodations, provision for yard or garden, and rents.

"The Wage Statistics in the Twelfth Census" are reviewed in an appreciative spirit in the *Journal of Political Economy* (June, 1904) by Miss Edith Abbott. Regret is expressed that tables of actual rates were not used, and that more definite conclusions regarding the trend of wages were not given.

Mr. Bowley also reviews the Census volume on "Employees and Wages" in the *Journal of the Royal Statistical Society* (September, 1904). Indorsement is given to the use of the percentile method, but the present volume is criticised because the scattered statements are not combined, and the report cannot easily be compared with others.

Professor W. F. Willcox summarizes in the *Yale Review*, November, 1904, certain conclusions in regard to the negro race as based upon his statistical studies. He believes that it was unwise to drop from the Census inquiry of 1900 the inquiry in regard to mulattoes, quadroons, and octoroons. While there are errors, they are in the same direction from census to census; and the results would be comparable. There is no traceable tendency to a separation between negroes and whites in the South. The per cent. of illiteracy is decreasing rapidly. "In industrial competition the negro seems during the last decade to have slightly lost ground in most of those higher occupations in which the services are rendered largely to whites. . . . The balance seems not favorable. It suggests that in the competition with white labor, to which the negro is being subjected, he has not quite held his own."

The exhaustive monograph by Dr. Francis Walker on "Monopolistic Combinations in the German Coal Industry" in the *Publications of the American Economic Association* (August, 1904), represents a remarkable amount of individual statistical research on all phases of the coal industry in Germany. Costs, prices, and profits are severally treated.

The November (1904) issue of the same *Publications* also contains a suggestive fact inquiry by Dr. H. W. Quaintance, in a study entitled "The Influence of Farm Machinery on Production and Labor."

The issue of *Charities* for Dec. 3, 1904, is largely devoted to articles on the Slav element in our immigration. In addition to a statistical

survey of the subject by Miss Claghorn, there are articles on the Bohemians in Chicago, Bohemian farmers in Wisconsin, Slavs in the coal regions, the Lithuanians, Poles in Baltimore, Slovaks, Ruthenians, Doukhobors, and Magyars in New York. Of allied interest is an article by Robert De C. Ward on "The Agricultural Distribution of Immigrants" in the *Popular Science Monthly* (December, 1904). Chinese and Japanese immigration is also considered in the same journal by Dr. Allan McLaughlin.